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DEMOGRAPHIC CHARACTERISTICS AND CAUSES OF DEATH IN TRAUMATIC PATIENTS DIED IN INTENSIVE CARE UNITS OF IMAM KHOMEINI HOSPITAL OF URMIA AT 2013

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ABSTRACT

Introduction: Traumas lead to patient hospitalization in ICU because of several reasons, which finally results in death of a number of these patients. Identifying the pattern and causes of death and confronting with its etiologic factors is one of the most appropriate strategies to increase the life span. Objective of the current study was to evaluate the frequency of demographic characteristics and the causes of death in patients died due to trauma in hospitalization management planning and treatment of patients and their prognosis.
Methodology: The current research is a descriptive cross-sectional study carried out to examine the causes of death of patients died because of trauma in the intensive care units of Imam Khomeini Hospital in Urmia since July 2 of 2012 to July 1 of 2013. Information contained in files of 86 patients died in ICU was recorded by a checklist and data were analyzed using SPSS 17 software.
Findings: The mean age of subjects was 44.8 ± 26.38 years and 72.1% of them were male and 70.9% of them were married. The most common causes of death included multiple trauma and CNS with 48.8% and 39.5%, respectively. Among types of traumatic mechanism, car accident and falling from height accounted for 65.1% and 26.7% of them, respectively. Most of the injured places were multi-organ with 47.7%, followed by head and neck with 38.4%, and majority of patients died within 7 to 2 days of hospitalization in ICU, and mean hospitalization duration was 16.57 ± 26.9 days.
Discussion and conclusion: The prevalence of trauma and injuries caused by it and rate of death were more among males. Its reason may be justified by the fact that most of them are working in high-risk jobs. The highest cause of trauma led to the death was car accidents. Observing the driving and traffic rules and regulations can be very effective in decreasing the number of trauma cases caused by accident.

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Introduction

Trauma is the leading cause of death and one of the main causes of disability among active population in developing countries (1,2,3,4,5). Unfortunately, less attention has been paid to importance of this issue in these countries (6). The situation becomes worse increasingly and based on World Health Organization (WHO) predictions, events caused by accidents will be the second cause of lost life in the world by 2020 (7). Management of traumatic patients is a clinical challenge. Deadly or mild injuries might be ignored in any stages, including surgical procedures, which it has been reported from 2% to 50% in various statistics (8). Caring traumatic patients is one of the main components of emergency medical function and emergency physicians play key role in stabilizing the clinical status and diagnosis of traumatic patients. Hence, decision-making, management, and skill of the intensive care unit have a great impact on outcome of these patients (9). Much research has been carried out to find the

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factors increasing the rate of death in patients. Patients hospitalized in ICU, depending on ventilation for more than 14 days, age alder than 65 years, infectious shock, patients with heart-kidney disease and hospital infections are factors increasing the rate of death in ICU (10). In a study conducted on 181 traumatic patients hospitalized in intensive care units, it was found that more than 84% of the causes were road traffic, led to death of 30 people (11). In a study carried out in order to determine the epidemiology of death caused by trauma in Nigeria's educational-medical hospital, it was found that two thirds of deaths belonged to those who had commercial, artisanal, driving, and schooling jobs and 75% of deaths were related to road accidents, and the most common cause of death was related to injury to head. In another study, it was found that the mean age was 36.8 and the dominant traumatic mechanism was due to bullet and road accidents, and 80% of them died in the first 48 hours, 6% of them died during 3-7 days, and 14% of them died after 7 days. In this study, it was found that damage to central nervous system with 42% was the most common cause of death (12). The traumas lead to patient hospitalization in ICU due to several reasons [13]. Finding suggests that investigation on epidemiologic factors and factors involved in death of patients admitted in intensive care unit and realizing the cause of the death of patients hospitalized in this ward will be effective in hospitalization management planning and treatment of patients and their prognosis (14, 15,16,17). On the other hand, the increasing cases of hospitalization caused by trauma in medical centers and shortage of beds in intensive care units in hospitals of Iran make it necessary to conduct a comprehensive study on epidemiology and causes of death in these patients .As Imam Khomeini Hospital of Urmia has been considered as a traumatic center in West Azarbaijan province and as great number of traumatic patients are hospitalized in ICU of this hospital, we hope that findings of this study to be used in improving and modifying the hospitalization management and diagnostic and therapeutic measures of traumatic patients by gaining primary knowledge and providing obtained information.

Methodology

This descriptive cross-sectional study was carried out in order to evaluate the distribution of demographic characteristics and the frequency of causes of death in patients hospitalized in intensive care units of Imam Khomeini Hospital of Urmia since July 2 of 2012 to July 1 of 2013 .After required coordinating with the Medical Files Department of Imam Khomeini Hospital and obtaining the information contained in file of 86 patients who died in the intensive care unit, data checklists prepared for this purpose were collected. Then, the information of the patients died in special care units was collected in the information collection form that included variables such as age, gender, cause of death, living place (urban or rural), trauma mechanism, duration from admission to death, the level of education and job. The results obtained from the study were analyzed using SPSS 17 software.

Findings

Findings of the current study revealed that the mean age of 86 patients died in this study was 44.8 ± 26.32 years, which 14 of them (16.3%) were in the age range of 0- 18 years old, 25 (29.1%) were in the age range of 19-36 years, 17 (19.8%) were in the age range of 37-54 years, 13 (15.1%) were in the age range of 55-72 years, and 17 (19.8%) were older than 72 years. In addition, it was found that 24 (27.9%) were female and 62 (72.1%) were male, 61 (70.9%) were married, and 25 (29.1%) were single .Among 86 patients participated in this study, 46 (53.5%) had elementary level of education or were illiterate, and 26 (30.2%) had secondary level of education, 8 (9.3%) had high school level of education, and education level of 6 of them was not known. Among 86 patients participated in this study, 45 (52.3%) were self-employed, 4 (4.7%) were employees, 14 (16.2%) were housekeeper, 3 (3.5%) were driver, 1 (1.2%) was pedestrian, 10 (11.6%) were children or infants, 3 (3.5%) were students, and job of 6 of them was not known. Additionally, 24 (27.9%) of the patients were living in village and 62 (72.1%) were living in the city.

Table 1: Frequency of causes of death in patients died because of trauma in intensive care units of hospital

Cause of death	CNS	Skeleton	Abdominal	Vascular	Cardiac	Multi-trauma	Total
n	34	5	3	1	1	42	86
%	39.5	5.8	3.5	1.2	1.2	48.8	100

Based on the findings of Table 1, the highest frequency of death belonged to multiple trauma (48.8%) and CNS (39.5%).

Table 2: Frequency of types of trauma mechanisms in patients died due to trauma in patients

Trauma mechanism	Being fired by bullet	Job accident	Hanging	Car accident	Falling from height	Poisoning	Quarrel	Other	Total
n	1	1	2	56	23	1	1	1	86
%	1.2	1.2	2.3	65.1	26.7	1.2	1.2	1.2	100

Based on the findings of Table 2, the highest frequency of types of trauma mechanism was related to car accident (65.1%) and falling from height (26.7%).

Table 3: Frequency of place of injury in patients died due to trauma in intensive care units of hospital

Place of injury	Visceral injuries	Lower limb	Upper limb	Head and neck	Chest	Multi-organ	Total
n	4	6	1	33	1	41	86
%	4.7	7	1.2	38.4	1.2	47.7	1000

Based on the findings of Table 3, the highest frequency of injury place was related to multi-organ (47.7%) and head and neck (38.4%).

Table 4: The length of hospitalization of patients died due to trauma in intensive care unit since admission to intensive care unit until death

Hospitalization duration in terms of day	0-1	2-7	8-30	<30	Total
n	22	28	22	14	86
%	25.6	32.6	25.6	16.3	100

The mean hospitalization duration in the present study was 16.57 ± 26.9 days. Based on the findings of Table 4, the highest frequency of injury place was related to three time interval of 2-7 days with 32.6% and interval of 0-1 day with 25.6% and interval of 8 -30 days with 25.6%

Discussion and conclusion

Based on the results of this research, the highest rate of patient died in intensive care unit of the Imam Khomeini Hospital of Urmia since July 2 of 2012 to July 1 of 2013 was the age range of 19-36 years. The mean age of the patients was 44.8 ± 26.22 years, which it is in line with the study conducted by Sulaqberu in which the mean age was obtained 36.8 years for men and 45.5 years for women (12) and findings of study conducted by Evans JA in which mean age was obtained 43 years as (18,19). However, it is not in line with results of studies conducted by Entezari et al in which mean age was 37.89 years and Sauaia A et al in which mean age was 36.8 years and the study conducted by Zamani (20) in which mean age was 30.5 ± 17.35 years and the highest rate of death rate was seen in age group of 24 to 15 years (19). It seems that people aged 50 to 30 to be at higher risk of trauma. In terms of gender distribution of the patients died in this study, men accounted for 72.1% of the deaths, which this finding is in line with findings of studied conducted by Sulaqberu BA et al in which male to female death ratio was 2.5 to 1, Entezari et al in which 73% of the deaths belonged to males (12), Evans JA in which 63% of the deaths belonged to males, and Zamani in which 73.6% of the deaths belonged to males (18). This reflects high correlation between male gender and incidence of trauma. In addition, in this study, 70.9% of the patients died in the intensive care unit due to trauma were married, and 93% of them had education level less than high school, and 43% of them were illiterate people. None of previous studies has investigated these two issues, while this study shows the possible relationship between low education level and being married and creation of trauma. Considering the job of died people, 51.2%, of them were self-employed that it is in line with study conducted by Sulaqberu BA et al, in which it was found that two thirds of the deaths belonged to those who had commercial, artisanal, driving and schooling jobs (18). In addition, 72.1% of them were living in cities, which it is not in line with the study conducted by Entezari et al in which 36.5% of them were living in cities. The most common cause of death in this study was multi-trauma and CNS injuries with 48.8% and 39.5%, respectively. This finding is in line with findings of the study conducted by Entezari et al in which 38.5% of subdural hematomas and 25% of epidural hematomas were found as the most common causes led to death of traumatic patients (causes of CNS). This finding was also consistent with finding of the study conducted by Evans JA in which CNS injury accounted for 33% the death in these patients. In addition, it was in line with the study conducted by Sauaia A et al in which CNS injury with 42% was found as the most common cause of death in these patients (18 and 19). However, it was in line with the study conducted by Abrishamkar et al in which the most common cause of death was respiratory failure of patients (37.9%). Among different types of trauma mechanisms, car accident accounted for 65.1% and falling from height accounted for 26.7% of types of trauma mechanism, which it was in line with studies conducted by Sulaqberu BA et al in which 75% of deaths were found to road accidents, Entezari et al in which 82.7% of road accidents led to death of traumatic patients (12), Evans JA in which the most common type of trauma mechanism was related to motor vehicles with 72%, and Zamani et al in which accident by motor vehicle and falling from height were the most common types of trauma mechanisms (more than 94%), respectively (18). However, it was not in line with the study conducted by Sauaia A et al in which the dominant trauma mechanism with 42% was bullet (19). The most common place injured in the patients died due to trauma in the intensive care unit was multiple-organ (47.7%), followed by head and neck (38.4%). This finding was in line with finding of the study conducted by Sulaqberu BA et al in which head injuries accounted for 31% and multiple-trauma accounted for 30% of the cases (12). However, it was in line with the study conducted by Zamani

et al (20), in which it was reported that the most common cause of death following trauma was chest, followed by head and face. In the interpretation of three cases of trauma mechanism, the place of the injury and the cause of death based on the findings of the current study and most of the previous studies, it can be realized that most of the traumas were due to road accidents, followed by multi-trauma in people, which among the places injured, trauma in head and neck was most important and most dangerous than others and injury in these places led to irreparable harms. Finally, it could be stated that most of the patients died due to trauma died during 2-7 days after being hospitalized in the intensive care unit and the mean hospitalization duration of all patients died in this ward since admission until death time was 16.57 ± 26.9 days. It is in line with the study conducted by Entezari et al in which it was found that 24.3% of patients were hospitalized only one day and 22.9% of them were hospitalized only two days in ICU. It is also consistent with the study conducted by Abrishamkar et al in which most of patients (12.8%) died in the first four days of hospitalization. In addition, it is in line with the study conducted by Sauaia et al in which 81% of them deaths occurred in first 48 hours (19). This suggests the necessity of providing more care for traumatic patients in the first days of their hospitalization.

Recommendations

Preventive actions on traffic accidents should be in priority of plans developed to decrease the death caused by car accidents. Appropriate planning in the work setting, observing the safety points, timely transmission of injured people, observing the driving and traffic rules, standardization of the work setting and vehicles, and increasing the awareness of people on observing the mentioned cases can be effective in decreasing the traumatic cases. Due to high prevalence of multi-trauma cases caused by car accidents, attention and accuracy of physicians and medical staff working in the emergencies and intensive care units, especially when they encounter with several injured people, and properly caring and treatment of them can contribute in decreasing the death of patients.

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