

Original Article

Causes of Mortality Among Patients Admitted in a Tertiary Hospital

Hassan Soleimanpour¹, Neda Gilani², Shima Shekari¹, Javad Morsali³, Kavous Shahsavarinia^{4*}¹Emergency Medicine Research Team, Tabriz University of Medical Sciences²Department of Statistics and Epidemiology, Faculty of Health, Tabriz University of Medical Sciences³Science Committee of Faculty of Engineering of Khoy, Urmia University⁴Road Traffic Injuries Research Center, Tabriz University of Medical Sciences**Corresponding Author:** Kavous Shahsavarinia, E-mail: kavous.shahsavari@yahoo.com

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ABSTRACT

Introduction: The analysis of causes of death in the hospital and identification and dealing with the causes of death, in one of the best strategies to increase longevity. This study, with the aim of better understanding of the causes of death and by taking into account all hospital wards, describes the causes of hospital mortality occurred in Sina educational and clinical hospital of Tabriz, in order to investigate demographic, clinical and cause of death variables for each disease separately. **Method:** This study is done by the sectional descriptive method in 2018 in Sina educational and clinical hospital of Tabriz. This hospital is the most important center for admissions of poisoning and burns in the North West of Iran. For this purpose, after obtaining a license, records of all patients who are admitted to hospital since 21 March 2018 until 19 March 2019, were extracted from the archives center in an elective and emergency form. Demographic and clinical variables were extracted from records and recorded in the questionnaire. The sample in counting the mortality occurred during one year was 626 cases according to documentations, that 88 cases were eliminated from study due to containing incomplete information. The data were analyzed by descriptive tests and SPSS18. **Findings:** The mortality rate in this study was 1%. 56.5% of those who died were male. Most deaths occurred among patients of over 75 years old. Among the under-15 age group the highest mortality rate were for burns. The most common causes of mortality, were, respectively, burns (19.33%), cancer (16.86%), and infectious disease (16.57%). Most deaths occurred in the special wards. In 61%, chronic and underlying diseases are reported. **Conclusion:** Since this hospital is the largest and most important teaching hospitals for burns, in the province, the most common causes of death in this study are result of burns. The high percentage of deaths from burns in children and young people shows the importance of informing the dangers of burn for preventing the occurrence of burns and control its effects.

INTRODUCTION

Nowadays the hospital mortality allocates large part of deaths of community to itself (1). So that hospital mortality statistics are considered as a valuable option to identify trends in past and present mortality and controlling factors that may cause to longevity (2). Issue of death in hospital patients is a problem that has been considered in recent years (3,4) and study the results related to mortality, shows some changes in causes of death from infectious diseases to chronic disease caused by technological advances, in the diagnosis and treatment of diseases (1). Therefore, the quality of care can be considered as an indirect indication of standards of health services provided by hospitals in developed countries (5). In assessing the health system in England (6) hospital mortality rate in different hospitals is different in range of 3.4 to 13.6 percent. The mortality rate in a year is about 350-320

thousand people in Iran, that approximately 35-40% is related to heart diseases, 18-20% is because of accidents, and 12-15% because of congenital contagious diseases, infants, malnutrition and chronic diseases(1).

Given that registration of mortality rates in many developing countries is not readily available, therefore review of hospital deaths is a valuable option (2). Brazil has a long history of Registration of deaths and critical assessment of the quality of mortality statistics to identify strengths and weaknesses of results (7). In Iran registration of deaths based on causes and certification characters of dead people, is an important step in determining and monitor of the pattern of mortality in the country. That this monitoring, shows dominant and common disease pattern over time and will help to determine health priorities, resource allocation, health oriented development priorities and eliminating the main causes of frequent deaths (1). Reliable information about the

causes of death is the necessity for health policy and control of diseases in human society. Despite the critical importance of planning and management in the health sector and having detailed information related to mortality, unfortunately, only a few developed countries have these statistics precisely. Therefore, further studies on the causes of mortality are necessary.

Therefore in this study researchers try to identify the causes of mortality among patients admitted to Sina Hospital, one of the most important teaching hospitals in the north-west of the country, to provide information of the death in hospital wards and for each season of year.

METHOD

This study is done in the cross-sectional way and census sampling for investigate the causes of mortality in the time period of 21 March 2018 until 19 March 2019 in Sina hospital of Tabriz city. Data collection tool was a questionnaire that was developed based on research questions and hypotheses. Reliability of check list was guaranteed by retest or running the test again, and validity of the results guaranteed by studding check list of similar studies and preparing a comprehensive check list of causes associated with hospital mortality. After obtaining permission, medical record of patients who died during 2018 related to Sina hospital were studied by visiting medical record archives of Sina hospital. Age, gender, history of hospitalization, drug records, chronic disease, duration of hospitalization, hospitalization ward, illness and cause of death, time of death, place of residence, how to go to the hospital, being transferred or not, Duration of stay in the emergency department, education level and occupation as underlying variables and the causes of death were collected. For statistical analysis of the studied population, descriptive tests of SPSS18 application are used.

FINDINGS

626 people are died out of 61915 patients during 1394 (1.01%). 538(85.94%) records were studied. 304 of dead people (56.5%) were male, 234 people (43.5%) female, (80.48%) married and (30.86%) over 75 years old. 226 people (42%) were transferred from other hospitals and 278 people(51.67%) came directly to the hospital that 58.85% were from East Azerbaijan province. 407 patients(75.65%) were admitted to ward through emergency department and 97 patients(18.3%) went directly to the relevant ward. In 94.24% final diagnosis of the cause of death has been determined. Table 1 and 2 respectively, demographic and clinical factors of individuals are shown.

According to the information Table 3 above 34.76% of the deceased were staying over 7 days. The 48.51% of subjects had a history of drug use. Lozartan and Aspirin was most used drugs. In 60.97% of cases chronic diseases are listed. High blood pressure and diabetes are diagnosed the most common previously underlying diseases that shows importance of high prevalence of these diseases in society and the necessity of health planning and public information

Table 1. Distribution of demographic characteristics

variable	Variable levels	Abundance	Percent
sex	male	304	56.5
	female	234	43.5
age	Under-15	19	3.5
	15-29	67	12.45
	30-44	67	12.45
	45-59	93	17.29
	60-74	126	23.42
	75=>	166	30.86
marital status	Single	59	10.97
	married	433	80.48
	missing	46	8.55
location	city	324	60.22
	Village	214	39.78
education	illiterate	185	34.39
	Primary	125	23.23
	Guidance	53	9.85
	Diploma	127	23.61
	Bachelor	12	2.23
	Graduate	6	1.12
	missing	30	5.57
	A history of disease	Yes	328
no		181	33.64
missing		29	5.39
History of hospitalization	yes	279	51.86
	no	206	38.29
	missing	53	9.85
History of drug use	Yes	261	48.51
	no	220	40.89
	missing	57	10.59

in the field of prevention, control and treatment of these diseases at the macro level of society.

As it is specified in the following table, ICU of burning ward and the emergency department allocated the most and the least mortality index to them, respectively. The mortality rate in each ward is calculated as mortality rate percent divide into frequency of ward discharge.

The most important causes of death in this study are burns (19.33%), cancer (16.86%) and infectious diseases (16.57%). The causes of death have been reported separately in Table 4.

DISCUSSION

This study can be considered as the first comprehensive study about the causes of mortality in hospitalized patient in various wards of a teaching hospital in north-west of country, 1% of the patients had died during the year. The mortality rate over a period of 5 years in the clinical wards in Nigeria (8) has been reported 22.8%. 56.5% of those who died were male. Mortality is more common among men (9), so that 61.1% of all deaths recorded in Iran (10) are for men.

Table 2. Distribution of clinical factors

Clinical factors	Variable levels	Abundance	Percent
Oxygen saturation) O2sat	Under 80	213	39.59
	Over 80	243	45.17
	missing	82	15.24
Breaths per minute	Under 12	168	31.23
	12 to 20	213	39.59
	Over 20	64	11.89
	missing	93	17.29
Diastolic blood pressure	Under 50	165	30.67
	50 to 100	237	44.05
	Over 100	49	9.10
	missing	87	16.17
Systolic blood pressure	Under 90	206	38.29
	90 to 150	211	39.22
	Over 150	54	10.03
	missing	67	12.45
pulse	Under 60	141	26.21
	60 to 100	137	25.46
	Over 100	185	34.39
	missing	75	13.94
Consciousness (GCS)	Under 5	117	21.75
	5 to 10	158	29.37
	Over 10	123	22.86
	missing	140	26.02
Hospital stay	Under 24h	63	11.71
	1-3 days	158	29.37
	4-7 days	130	24.16
	Over 7 days	187	34.57
	missing	-	-
transferred	yes	226	42
	no	278	51.67
	missing	34	6.32
Place of death	Outside the hospital	42	7.81
	Inside the hospital	496	92.19
	missing	-	-
Time of death	day	212	39.41
	night	326	60.59
	missing	-	-
The final diagnosis	yes	507	94.24
	no	31	5.76
	missing	-	-

In studies, most of the mortalities are reported in old ages (usually over 60) due to diseases (11). In this study, the highest death rates among ages over 75 years that about 60% occurred in the evening hours (7 pm to 7 am).

Table 3. Distribution of mortality in the hospital wards

ward	Number of deaths	Number of ward discharge	Index of mortality (%)
ICU burns	106	111	48.85
ICU Internal	83	130	38.97
ICU Infectious	45	84	34.88
ICU Surgery	49	248	16.50
MDR	6	137	4.20
Infectious	28	848	3.20
Internal and poisoning	103	3245	3.08
Burn	26	1567	1.63
Dialysis	7	603	1.15
Skin	3	309	0.96
Surgery	14	5976	0.23
Emergency department	68	43394	0.16

In about 70% of deaths, histories of chronic disease have been reported people who died. High blood pressure and diabetes are the most common underlying previous disease. While the research emphasis on lower quality of life in patients with chronic disease (12). This issue needs special attention of authorities to the high prevalence of the disease in the community and the need for health planning and public information in the field of prevention, control and treatment of these diseases at the level of society.

According to the results, about 40% of people who have died had oxygen saturation below 80% and hypotension. Since 42% of patients were transferred from other centers, the interval between arrival at the hospital until the problems have been discussed and further investigation is needed in the field of pre-hospital system performance. However, it is noteworthy that a high percentage of burn patients at first had clinical symptoms in mid-range (Table 2), that over time and after hospitalization in the coming days their clinical symptoms gradually worsened. Most deaths in this study have been recorded at special section; this is despite the fact that more than half of the total death occurred at ICU wards, that requires strengthening and continuously special care. In the conducted studies about 50% (1) of the deaths occurred in emergency departments. It is noteworthy that in 320 cases (78.62%) of deaths, duration of stay in the emergency room is less than 6 hours and in mentioned time patients were decided that this can be important in terms of timing, diagnostic procedures and treatment of patients in this center. so that the important role of a hospital emergency department has a significant relation with reduction of mortality rate (13) and presence of a emergency medical team reduces the mortality rates in hospital (14).

As results, the most causes of mortality is reported burns (19.33%), cancer (16.86%) and infectious diseases (16.57%). Burns are the most common causes of death in this study, because this center is referral in the north-west of country. Death from burns is in the accidental causes of death and happened for less than 15 ages. In studies, the causes of

Table 4. Frequency distribution of causes of death in people who have died

Cause of Death	Diagnosis	Abundance (%)	The overall Abundance (%)
Burn		133(100)	133(19.33)
cancer	Breast	32(27.59)	116(16.86)
	Lung	21(18.10)	
	Digestion	49(42.24)	
	Blood	14(12.07)	
infectious disease	Sepsis	43(37.72)	114(16.57)
	Pneumonia	52(45.61)	
	Influenza	11(65.9)	
	Pulmonary TB	8(7.02)	
Poisoning		83(100)	83(12.06)
Lung disease	Acute Respiratory Distress Syndrome (ARDS)	43(57.33)	75(10.90)
	Pulmonary edema	7(9.33)	
	Pulmonary thromboembolism	25(33.33)	
Intestinal diseases	Cirrhosis of the liver	13(20.63)	63(9.16)
	Mesenteric ischemia	14(22.22)	
	Gastro intestinal bleeding (GIB)	21(33.33)	
	Ileus	15(23.81)	
kidney disease	Acute renal failure	40(75.47)	53(7.70)
	ESRD	13(24.53)	
Heart disease	Myocardial infarction (MI)	32(82.05)	39(5.67)
	arrhythmia	5(12.82)	
	High blood pressure	2(5.13)	
Electrolyte disorders		9(100)	9(1.31)
Skin diseases		3(100)	3(0.44)

death are different and depend on most expertise of center. Death due to internal system diseases, cardio - vascular and cancer (9), cardiovascular disease, accidents, infections and cancer (11) respectively have been recorded in the studies. The results of this study suggest that a low rate of mortality in the hospital is due to cardiovascular diseases. This is noteworthy that this center is not a heart referral center, so due to low patient with heart diseases, deaths from these diseases are not the most common cause of death in the center.

Gastrointestinal cancer (42.24%) was the major cause of death in cancer patients. Since cancer incidence in high in this area (15-16), education and modifying lifestyle for the region is noted. Infection itself or as a infection and septicemia, are the most common causes of mortality(8) that shows occurrence of contagious and non-contagious diseases(17). Therefore community interventions should aim at preventing the spread of these infections and community screening for early detection of hypertension, diabetes, chronic kidney disease and cancer.

CONCLUSION

This hospital is the largest and most important teaching medical burn center in province, the most common causes of mortality in this study is the result of burns. As the results, a high incidence of burns and chronic disease and the age

of the patients died show the importance of prevention and control of these diseases in this area. The high percentage of deaths from burns in children and young people shows the importance of informing the dangers of burn for burn prevention and controlling its effects. According to the high number of deaths in the transferred clients, this study demonstrates the importance of the first aid and dispatching in a timely manner ambulance and also notes the need to fast an appropriate delivering of the patient. According to the relatively high mortality in the evening hours and to reduce the statistics, medical staff including nurses and aides suggested the center in the evening and night shifts to be more careful.

MORAL CONSIDERATIONS

Present study is done after authorization and necessary coordination and also after ratifying the plan in Tabriz University of Medical Sciences Ethics Committee. data collected from People in the study was anonymous and in encrypted form. The collected data were recorded for actual and without abuse.

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