ISSN: 2091-2331 (PRINT) 2091-234X (ONLINE)

Journal of Nobel Medical College
Available Online: www.nepjol.info, www.nobelmedicalcollege.com.np
Volume 6, Number 2, Issue 11, July-December 2017, 48-52

Original Article

Mortality pattern in Emergency Department of a Tertiary Care Center in Western Nepal

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Received: 14th August, 2017; Revised after peer-review: 27th September, 2017; Accepted: 20th October, 2017
DOI: http://dx.doi.org/10.3126/jonmc.v6i2.19570

Abstract

Background

There is abundance of evidence regarding various aspects of mortality in emergency department from different parts of world but there is limited number of studies on mortality in context of western Nepal. The objectives of this analysis were to review the demographical pattern of mortalities and define the cause and frequency of death in the Emergency Department (ED) of our institute within 24 hours of treatment process.

Material and Methods

A retrospective study was carried out evaluating all patients who died during the treatment process in the Emergency Department of Lumbini Medical College in a three and half year of period from January 2014 to June 2017.

Results

A total of 33,472 patients attended to ED with mortality rate of 36.4%, 33.6% and 28.2% on consecutive three years in which 110 deaths occurred. There were 66 (60%) male and 44 (40%) female. The highest mortality was seen after age of 60 years (range 2 month to 90 year). Non-communicable causes & stroke deaths were found to be higher in number. Most of our patient n=52 (47.3%) death occurred within 6-12 hours of admission in ED.

Conclusion

Mortality within 24 hours of presentation at ED remains high. Well organized emergency setup, transport, development of protocol as well as new guideline will definitely help in reducing hospital mortalities.

Key Words:

Emergency, Mortality, Pattern

Introduction

Emergency Department (ED) is the first point of call for all critically ill in any hospital all over the world. In the ED, severity of various illness and injuries are seen and managed. Due to unplanned nature of patient attendance in emergency, the management of these patients is often challenging, so manpower requires immediate attention. The mortality and morbidity in the ED is directly related to the pre-hospital factors, adequate trained manpower and infrastructures [1-3].

There are many factors for deaths occurring in ED. These include poor pre-hospital care for ill and injured patients, distance between the patients place of abode and the hospital and the types of illness or injury. Also, the paucity of skilled manpower in many clinical fields and poorly equipped ED affect the mortality pattern [3,4]. It has been reported that 15-

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16 % of all the mortalities in a hospital occur in ED [5]. World Health Organization (WHO) claims that statistics on mortality pattern in ED should be available for evaluation of existing health care services which is a kind of managerial process in any health institute [6].

There are very limited numbers of studies on mortality pattern in context of Western Nepal. This study aims to seek the demographic mortality pattern and its causes in the ED of a tertiary center of Palpa within 24 hours of arrival.

Material and Methods

A retrospective review of the death records during admission at the ED of Lumbini Medical College Teaching Hospital was carried out over three and half year period from January 2014 to June 2017. Information was retrieved from patient case files and death certificates. Variables included were patient demographic data, clinical diagnosis, and duration of admission and time duration before death. All brought dead patients were excluded. The variables were analyzed in number and percentage by using SPSS 20.

Results

In a three and half year's period from January 2014 to June 2017, a total of 33,472 patients attended the ED. One hundred ten patients died giving a crude mortality rate of 0.33%. There were 66 (60%) male deaths and 44 (40%) female deaths, giving a mortality male: female ratio of 3:2. (Table 2)

Table 1: Mortality in various age group

Age Group	(n)	(%)
<10	3	2.7
10-20	2	1.8
20-30	1	0.9
30-40	10	9.1
40-50	15	13.6
50-60	17	15.5
60-70	31	28.2
>70	31	28.2
Total	**110**	**100**

Table 2: Mortality in both sexes in each year

Year	Sex		Total n(%)
	Male n(%)	Female n(%)	
2014	23 (20.9%)	17 (15.5%)	40 (36.4%)
2015	25 (22.7%)	12 (10.9%)	37 (33.6%)
2016	16 (14.5%)	15 (13.6%)	31 (28.2%)
2017	2 (1.8%)	0 (0%)	2 (1.8%)
Total	66 (60%)	44 (40%)	110 (100%)

The month with the highest proportional mortality was in August. The mortality rates were 36.4%, 33.6 %;28.2 % and 1.8% in consecutive three and half years (Table No: 2). The highest number of deaths recorded was in above 60 years of age (Table No 1). The non-communicable cause for death 101 (91.8%) was found more than communicable causes 9 (8.2%). Stroke was found to be leading cause of death n = 16 (14.5%) followed by acute myocardial infarction n = 15 (13.6%), upper GI bleeding n = 14 (12. 7%) and pneumonia n = 14 (12.7 %) (Table No 3).

Table 3:Clinical causes of patient death in Emergency Department

Causes of Death	Number	Percentage
Upper G.I. Bleeding*(Esophageal varices, Gastric and esophageal cancer, Peptic ulcer diseases)*	14	12.7
Tetanus	1	0.9
Stroke	16	14.5
Sepsis	6	5.5
Poly trauma	2	1.8
Poisoning	1	0.9
Pneumonia	14	12.7
Intestinal perforation	3	2.7
Intestinal obstruction	1	0.9
Hepatic Encephalopathy	2	1.8
Heart failure	2	1.8
Head injury	8	7.3
Hanging	1	0.9
Chronic kidney disease	5	4.5
Chronic obstructive pulmonary disease	4	3.6
Alcoholic liver disease	5	4.5
Acute respiratory failure	7	6.4
Acute respiratory distress syndrome	2	1.8

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Acute Myocardial infarction	15	13.6
Acute leukemia	1	0.9
Total	110	100

Stroke was the main cause of death in above 70-year age patients and comorbid conditions associated with stroke death were hypertension, diabetes mellitus and valvular heart disease. Eight (7.3%) mortalities were recorded from head injury, seven (6.4%) acute respiratory failure and six (5.5 %) sepsis. Fifty-two (47.3%) died within 6-12 hours of arrival (Table No 4).

Table 4: Time Duration before death

TimeIn hours	Number	Percentage
<1	6	5.5
1-6	48	43.6
6-12	52	47.3
12-24	4	3.6
Total	110	100

Discussion

Any hospital in the community can provide scientific information on the pattern of hospital death which is a useful indicator of its health situation. The study had a high female to male ratio of Emergency attendance but many studies in Africa have shown the male attendance in ED were more than female [7]. Among 33,472 patients attended in ED, 110 deaths were recorded with a mortality rate of 0.33% but the mortality rate reported by several studies done in hospitals of Nigeria were in the range of 2 - 6.8 % [3-8]. We observed a gradual decreasing in mortality rates in three consecutive years that may be due to increased health awareness in people as well as easy health facilities in sub urban & urban center.

In our research, highest mortality rate in male compared with female patients followed the pattern reported by other studies [9,10]. Male death was found to be higher and may be related to more prevalence of non-communicable infectious disease like chronic hypertension, Ischaemic heart disease, chronic alcoholism, neoplasms etc and probably male are more involved in high risk activities to earn their living [11]

The most deaths were recorded after the age of 60 years. Beckett et al reported 66% of death in three London EDs in patients over 60 years but in many studies had shown that most deaths were seen in young patients [3,12,25].

In our study, 91.8% of deaths were from non-communicable causes which were comparable to the report from new WHO Report [13]. It may be due to the improved personal hygiene and good immunity power after repeated coverage of national immunization program within the country.

The cause of death may vary from country to county. In our study, stroke was the commonest cause of death (14.5%) and head injury being relatively less (7.3%). The relative high stroke deaths may be due to uncontrolled or poor hypertension states; also, hypertension is a recognized independent risk factor for death. Many papers revealed that stroke and motor vehicle accidents (MVA) were found to be leading causes of deaths unlike several reports of urban and semi-urban tertiary health centers, road traffic accident (RTA) was leading cause of death [3,10,14]. The stroke mortality may reflect the quality of medical care available at emergency or uncontrolled hypertension to cause stroke [15,16]. Cardiac causes were predominant in Europe, USA and some Non-Western nations [12,17,18].

In our study acute myocardial infarction being the second most common cause (13.6%) followed by Upper GI Bleeding (7.3%) acute respiratory failure (6.4%) and sepsis (5.5%). Myocardial infarction / Ischemic heart disease was the commonest cause of death (55.56%) as shown in the study of Beckett et al [12]. In the study of Khan et al, sepsis (23%) myocardial infarction (19.7%) stroke (10.7%) and

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pneumonia 8.2%) were the leading causes of death [19].

Our study showed 47.3% of death was in between 6-12 hour of arrival followed by 43.6% in 1-6 hours & and 5.5% in less than 1 hour of arrival. Ekere et al found that 70.9 % cases died within 6 hours of arrived in ED and Rukewe et al reported it to be 43.4% within 5 hours of arrival [3,20]. In the limitations of our study, firstly it is a single hospital-based study where patients might be inadequate for critical analysis to meet the objective of the study. Secondly, most of the patients who died in ED had no post mortem examination for actual cause of death.

Conclusion

Stroke was found to be the major non-communicable disease related death presenting in ED. Most of the deaths were recorded after 60 years of age, which occurred within 6-12 hours of admission. Such high mortality in ED may be multi-factorial such as lack of pre-hospital care, late in presentation, delayed referral system, high poverty level causing poor access to quality health care.

So, promotion of an adequate and competent manpower in ED, efficient pre-hospital care, well organized ambulance service, vital infrastructures such as diagnostic and therapeutic facilities would help in reducing the emergency mortality.

Conflict of interest: None

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