

Mortality at Emergency Department of BP Koirala Institute of Health Sciences: A Retrospective Review

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Abstract

Background: The emergency department (E. D.) of any hospital is an important entry point of critically ill patients. The initial management of these patients is often challenging, and for valuable lives to be saved, the infrastructure and manpower should be up-to-date.

Materials and Methods: This retrospective study was carried out from previous medical record of emergency ward of B. P. Koirala Institute of Health Sciences (BPKIHS) from April 2015 to March 2016. Total duration of study was one year. Data was extracted from medical records, entered in MS excel and analyzed with SPSS software.

Results: The mortality rate at the BPKIHS emergency ward was 1.05%. Their ages ranged from 10-91 years with 43% of deaths among age >60 years. There was a similar proportion of death among the males and females, with almost 90% of cases in the Australian Triage Score (ATS) 1 and 2, i.e. the most severe cases. Sepsis, chronic obstructive pulmonary disease and chronic kidney disease were the common causes of death in BPKIHS emergency ward.

Conclusion: Mortality was high in ATS 1 and 2, i.e. severe cases of ED. There is a need for further exploration of the cases including the morbidity profiles at BPKIHS emergency ward. More studies are needed to come to a conclusion regarding the quality of care.

Keywords: Emergency ward, mortality

Introduction

The emergency department (ED) is an important entry point for critically ill patients. The initial management of these patients is often challenging. Adequate technical and administrative resources are needed for better service to these patients. The morbidity and mortality at the ED is an indicator of the adequacy or otherwise of the state of clinical care and infrastructure.¹ There is usually a scarcity of skilled manpower in many clinical areas especially in trauma, as well as poorly equipped emergency units in the developing countries. Late presentation at the point of care,

ignorance and the interference by untrained persons claiming to give medical care, often lead to most avoidable death.^{2,3}

According to a review of 59 low and middle income countries (LMICs), the emergency care is burdened with high loads of patients and high mortality in the emergency room. There is need to further explore this problem and work towards improving care and reducing deaths in the emergency room.⁴ Mortality is used as an indicator for quality of care and to identify gaps in clinical care.⁵ Quality of care and demand in the emergency care can affect the quality of inpatient care in a hospital.⁶ Performance indicators for emergency can be measured also using ED time intervals, patient centeredness and safety performance.⁷ While there are no

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enough evidences on the reliability, validity and safety of the triage scales used, hospitals around the world use triage systems in emergency care settings.⁸⁻¹⁰

There are few studies in Nepal regarding mortality at emergency room. Some studies done at major hospitals around the capital city, Kathmandu can be found. The studies report that there is overcrowding of cases, low availability of health care professionals and mostly unavailability of health care providers specially trained in emergency medicine.¹¹⁻¹³

Mortality review at Tribhuvan University Teaching hospital and Patan Hospital, two of the major public hospitals in Kathmandu valley, report the mortality rate to be 0.36%¹⁴ and 0.17%¹⁵ respectively. This is the first published literature from B. P. Koirala Institute of Health Sciences (BPKIHS) regarding the mortality in Emergency care.

Emergency ward at BPKIHS, Teaching Hospital

BPKIHS is an autonomous Health Science University owned by the Ministry of Health and provides tertiary care services to eastern Nepal and some states of India catering close to 1 million people which is more than 1/3rd of the Nepalese Population. BPKIHS has a 700 then, and now 800 bedded general hospital which serves more than 40,000 patients annually. The hospital has a 55 then, and now 85 bedded unit for emergency care run by the Department of General Practice and Emergency Medicine.¹⁶ The Department is among the two institutes in Nepal that provide formal specialized fellowship training in Emergency Medicine in Nepal.¹³ The health care team providing emergency care includes General Practitioners, Trained

Emergency fellows, General Practice Resident Doctors, Medical officers and Nurses.¹⁶

The emergency care is organized using the Australian Triage Score (ATS).¹⁶ According to this triage system with five categories based on severity with ATS 1 as the most severe and ATS 5 as the least severe, this guides the time to attend the case at the emergency.¹⁷ There are other methods of triage at the emergency room around the world.¹⁸

Mortality among cases presenting at the ED relates to the quality of pre-hospital care, the time lapse between injury and treatment, and type and extent of injury sustained.¹⁹ We have, therefore, found it important to conduct a mortality review at the emergency ward of B. P. Koirala Institute of Health Sciences and produce a baseline status of the emergency care at the hospital. The objective of the study is to describe the profile of mortality cases at the emergency ward of B. P. Koirala Institute of Health Sciences, Dharan, Nepal.

Materials and Methods

This is a descriptive study conducted by retrospectively reviewing the medical records documented in paper, of the emergency room of Department of General Practice & Emergency Medicine at B. P. Koirala Institute of Health Sciences, Dharan Nepal from April 2015 to March 2016 (1 year). Thirty five thousand three hundred twenty four (35,324) patients were seen in the emergency ward during the period. A total of three hundred and seventy three (373) mortalities recorded in the study period were included in the study. There were 260 cases that were brought dead in the emergency, which was not included in the study. All mortality cases at emergency ward were included in the study. We

excluded cases that were brought dead or cases that has no sign of life during presentation to emergency ward.

Patient identifications were removed from the extracted data. Age, sex, Australian Triage Scoring (ATS) score, resuscitation note from the ED, duration of stay in the ED, mode of visit, time of presentation at ED, and the diagnosis at the ED were the variables taken into consideration in this study. The results were presented in descriptive form using frequency and percentages.

The study was conducted after obtaining clearance from the Institutional Review Committee of B. P. Koirala Institute of Health Sciences, Dharan, Nepal. (IRC No.-612/072/073-IRC)

RESULTS

The mortality at the ED of BPKIHS is 1.05%. Almost half (43.7%) of the cases were above the age of 60 years. There were almost equal proportions of male and female cases. More than half (62.2%) of the cases were categorized as Australian Triage Score 2. Majority (64.6%) of the cases stayed in the ED between 1-12 hours. Three-fourth (76.9%) of the cases visited the ED directly. The patients' visits at the ED during day were almost double in number compared to night (Table 1).

Table 1: Socio-demographic and clinical characteristics of the mortality cases (n= 373)

Characteristics	Number	Percentage
Age (years)	< 15	3 0.8%
	15- 29	58 15.5%
	30- 44	61 16.4%
	45- 59	88 23.6%
	> 60	163 43.7%
Sex	Male	175 53.1%
	Female	198 46.9%

ATS Scoring	ATS 1	96	25.7%
	ATS 2	232	62.2%
	ATS 3	42	11.3%
	ATS 4	3	0.8%
Duration of stay in ED (hour)	< 1	50	13.4%
	1- 12	241	64.6%
	12- 14	63	16.9%
	> 24	19	5.1%
Mode of Visit	Referral	287	76.9%
	Direct	86	23.1%
Time of presentation at ED	Day	238	63.8%
	Night	135	36.2%

The diagnosis of the cases at the ED prior to death can be found in table 2.

Table 2: Diagnosis of the mortality cases at the ED prior to death (n= 373)

Diagnosis	Number	Percentage
Sepsis	97	26.0%
COPD and respiratory failure	49	13.13%
CKD and related conditions	37	9.91%
RTA/ Trauma/ Blast injury	35	9.38%
CLD and related conditions	32	8.57%
MI and related conditions	27	7.23%
Cardiac failure and related conditions	22	5.89%
CVA (hemorrhagic)	19	5.09%
Poisoning (rat killer, OP, unknown)	15	4.02%
Diabetic ketoacidosis and related conditions	10	2.68%
Surgical abdomen	09	2.41%
Burn	08	2.14%
Self harm (hanging, cut throat)	06	1.60%
Electrical injury	04	1.07%
Snake bite	03	0.80%

Discussion

The mortality rate at the ED of BPKIHS in this study was 1.05%. Two hospitals located in Kathmandu, the capital city of Nepal report lower rates of 0.36% and 0.17%.^{14,15} The mortality is slightly higher in BPKIHS than the hospitals in Kathmandu. The reasons for this should be explored as BPKIHS hospital is considered a higher center for healthcare run by Nepal government for the benefit of people in eastern Nepal. While there are private hospitals and medical college hospitals in another city about 40 km away, BPKIHS still serves as the largest and oldest tertiary referral center in eastern Nepal. Therefore, serious cases or/and referred cases visit the emergency department at BPKIHS. This study finds that 3/4th of the emergency cases at BPKIHS were referred from other centers. One of the reason for low mortality rate observed in the studies done in two above-mentioned government hospitals located in Kathmandu may be that the mortality burden is shared by existing other tertiary level hospitals in Kathmandu.²⁰ The other reason may be easy access to transport and ambulance facilities in capital city, reducing the delay to reach hospital in many instances.

The mortality at ED of BPKIHS can also be explained by the proportion of severe cases, i.e. ATS 1 and ATS 2 comprising of 87.9% of the mortality cases. These are the most severe cases that may be from among the referred centers. While sepsis is the 4th cause of death of cases at ED comprising 10% of the deaths in Tribhuvan University Teaching Hospital of Kathmandu¹⁴, our study found sepsis to be the first cause of death comprising more than 1/4th of the deaths at ED of BPKIHS. Although ATS being used for triaging patients at emergency room of

BPKIHS is an acceptable tool to identify severe sepsis cases²¹, there may be a need to introduce intervention targeting to prevent deaths due to sepsis.^{22,23} More proportion of sepsis death could indicate inadequate pre-hospital care before reaching the emergency ward.²⁴ In our setting, there is no provision for pre-hospital care on the way while being carried to hospital in the ambulances. Only when patients are referred from other health institution do they receive some care on the way, otherwise, virtually no case management except for oxygen masks on rare occasions on the way in the ambulances. Trained paramedics providing pre hospital care is virtually not available in Nepal.²⁵ This seems an area for exploration for a high sepsis death at ED of BPKIHS. There can be several area of improvement to minimize the mortality rate which demands further research.

Conclusion

Mortality is high among ATS 1 and 2 areas and among sepsis cases in ED of BPKIHS. The mortality needs further exploration so that it can be useful to build further research regarding quality of care, and interventions to further improve the indicators of emergency care at BPKIHS. More studies are needed to come to a conclusion regarding the quality of care.

Abbreviations

ATS	Australian Triage Score
COPD	Chronic Obstructive Pulmonary Disease
BPKIHS	B. P. Koirala Institute of Health Sciences
CKD	Chronic Kidney Disease
CLD	Chronic Liver Disease
CVA	Cerebro Vascular Accident
ED	Emergency Department
MI	Myocardial Infraction
RTA	Road Traffic Accidents

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