

Clinical profile of non-traumatic adult emergency department admissions in tertiary care hospital

Vijay Kumar S S, Shabbir Shekhli, Vijaylakshmi P B, Rajanikanth S Malapur

Department of Emergency medicine, SDM Medical College, Sattur, Dharwad, Karnataka, India.

Abstract

Background: The assessment of outcomes among patients admitted to the emergency department (ED) is challenging often unreliable, particularly in patients who are in between the two extremes of illness. The aim was to assess the spectrum, pattern, characteristics, and clinical outcomes of Emergency department(ED) admissions of adult non-trauma patients.

Methods: The study was a prospective, single-center study. All patients admitted to the ED between May 2017 to June 2017 were included in the study. Demographic profile, detailed history, physical examination, management, and outcome were noted in Performa defined and designed for the purpose. Descriptive study was carried out by mean and standard deviation for quantitative variables, frequency, and proportion for categorical variables. SPSS for Windows Version 22.0 Released 2013 was used.

Results: 100 patients were included in the study, males were predominant 53% and females accounted for 47%. Most common chief complaint was fever (21.4%), followed by toxic substance ingestion (17.8%), breathlessness (16%), vomiting (8.9%), altered sensorium (7.1%), and loose stool (6.5%). Breathlessness at admission was found to be an immediately life-threatening complaint. The mean duration of hospital stay was 4.23days in non-survivors compared to survivors 5.82days. Admissions to ICU (62%) more in number compared to the ward (38%). The vast majority (74%) of emergency patients survived.

Conclusion: Patients admitted to the Emergency Department (ED) are highly heterogeneous in terms of disease spectrum and severity. The patient demographics and other characteristics identified by this study help us to guide better prioritization of care and resource allocation.

Keywords: Emergency Department (ED), Emergency Medicine, Acute Care

Introduction

Emergency Medicine is a new complex specialty; primarily involves multidisciplinary care for all sorts of patients with a critical illness. India's large population poses a challenge for the country's healthcare system. India has a significant shortage of trained physicians nationwide^[1]. Emergency care is offered in areas designated as *casualties* that are often managed by casualty medical officer with a little overview and are mere referral points for specialized care. Triage, something that is instrumental to good emergency care, is rarely practiced^[2]. The assessment of outcomes among patients admitted to the emergency department (ED) is challenging often unreliable, particularly in patients who are in between the two extremes of illness^[3].

Emergency departments (EDs) provide round-the-clock emergency care and also the source for most hospital admissions^[4]. ED triage presents the first opportunity to promptly identify high-risk patients^[5]. Information related to the spectrum and patterns of emergencies for which patients visit the emergency departments and their outcomes often indicates the actual status of different health issues in a community. Furthermore, such information is essential in healthcare planning and provision of essential health services. Including key resources like equipment, hospital space, and other logistics.^[6,7]

The present study is aimed to describe the profile of patients attended, outcome, and mortality in the emergency department. Also, this study may give information on efficiently delivering limited resources

Corresponding Author:

Dr. Shabbir Shekhli

Department of Emergency medicine, SDM college of Medical sciences & Hospital, Sattur, Dharwad, Karnataka, India.

E-mail: drshabbir9880033401@gmail.com

to the most needy on priority. The aim of the study was to assess the spectrum, pattern, characteristics, and clinical outcomes of emergency department admissions among adult non –trauma patients.

Material and Methods

Study design: A prospective study was undertaken in the Emergency Department of tertiary care hospital for a period of May 2017 to June 2017.

Study protocol: All patients presented to ED were initially managed and stabilized; patients who required further management were admitted to the emergency ward and emergency ICU, then cross consultation was taken and handed over to the respective specialty departments.

Inclusion criteria:

- Patients >18 years age admitted with acute medical complaints.

Exclusion criteria:

- A pregnant patient presenting to the resuscitation room for delivery.
- Patients seeking repeated consultation on the same day.
- Patients were brought dead on arrival.

Patient's data was collected at the time of admission in terms of age, gender, nature of the disease, and the chief complaints they presented with, vital signs, ECG, and co morbidities. Later follow up was done for lab findings and outcome.

We compared profiles between two groups; survivor group which includes the patients who are successfully discharged after recovery and the non-survivor group which includes the patients who died.

Statistical Analysis:

Descriptive Statistics: Descriptive study of all the data and outcome parameters was done using mean and standard deviation for quantitative variables, frequency, and proportions for categorical variables.

Inferential Statistics:

Chi-Square test was used to compare the chief complaints, co-morbidities, patients' admission, Loss of Independence, ECG & LFT findings between Survivors and Non-survivors.

Mann Whitney U test was used to compare the mean values of vital parameters, Laboratory parameters & Prognostic indicators between Survivors and Non-survivors.

The level of significance was set at $P < 0.05$.

Results

One hundred patients presenting in the ED who fulfilled inclusion criteria were included in the study. In our study subjects were all adults, the youngest was 18 years of age, and the oldest was 85 years of age. The maximum number of subjects was in the age group of 20 to 60 years (63%). Males were predominant 53% and females accounted for 47% (table1). The mean age among survivor 43.1 years and non-survivor 51.1 years. The table 2 shows, most common chief complaint was fever (21.4%), followed by toxic substance ingestion (17.8%), breathlessness (16%), vomiting (8.9%), altered sensorium (7.1%), loose stool (6.5%), abdominal distention (2.3%), abdominal pain (1.7%), headache (1.1%), hematemesis (0.5%), convulsion (0.5%) and others (15.4%). Breathlessness at admission was found to be significant ($p=0.04$) predictor of mortality. Table 3 shows the most common comorbidity was hypertension (31), Type 2 diabetes mellitus (21), COPD (6), asthma (4), thyroid, and CKD (2). None of the co-morbidities among survivor and non-survivor were significant with the outcome. Table 4 shows vital parameters measured at the time of admission, such as Respiratory Rate, Peripheral oxygen saturation at room air found to be significant in the study population. Table 5 and 6 shows, abnormal laboratory investigation like platelet count, blood urea, s creatinine, s potassium, LFT and abnormal ECG done at the time of admission were significantly associated with mortality and morbidity, patients admitted to ward among survivor was 34 (45.9%) and non-survivor 4(15.4%) and admitted to ICU among survivor was 40(54.1%) and non-survivor 22(84.6%) with p-value < 0.006 which was statically significant (graph2). The table 6 and graph 3 shows, outcome and hospital stay among total study population survivor were (74% & 5.72) and non-survivor (26% & 4.23).

Age (years)	Survivors				Non-Survivors				Total			
	Males		Females		Males		Females		Males		Females	
	n	%	N	%	n	%	n	%	n	%	n	%
<= 20	4	11.1	6	15.8	1	5.9	0	0.0	5	9.4	6	12.8
21 - 40	12	33.3	15	39.5	5	29.4	2	22.2	17	32.1	17	36.2
41 - 60	9	25.0	8	21.1	6	35.3	6	66.7	15	28.3	14	29.8
61 - 80	9	25.0	8	21.1	4	23.5	1	11.1	13	24.5	9	19.1
81 - 100	2	5.6	1	2.6	1	5.9	0	0.0	3	5.7	1	2.1

Complaints	1	2	1+2	c ² Value	P-Value
	n	n	Total (%)		
Fever	26	10	36(21.4%)	0.092	0.76
Vomiting	10	5	15(8.9%)	0.493	0.48
Loose Stools	9	2	11(6.5%)	0.393	0.53
Breathlessness	16	11	27(16%)	4.177	0.04*
Headache	1	1	2(1.1%)	0.61	0.43
Toxic Ingestion	25	5	30(17.8%)	1.940	0.16
Abdominal Distension	2	2	4(2.3%)	1.247	0.26
Altered Sensorium	9	3	12(7.1%)	0.007	0.93
Hematemesis	0	1	1(0.5%)	2.875	0.09
Abdominal Pain	2	1	3(1.7%)	0.086	0.77
Convulsions	0	1	1(0.5%)	2.875	0.09
Other	21	5	26((15.4%)	0.837	0.36
Total	121	47	168(99.2%)		

*Breathlessness was important predictor of mortality. 1-survivor 2- non-survivor

Associated Comorbidities	Survivors		Non-Survivors		c ² Value	P-Value
	n	%	n	%		
Type-2 DM	14	18.9%	7	26.9%	0.743	0.39
HTN	20	27.0%	11	42.3%	2.100	0.15
Thyroid Disorder	1	1.4%	1	3.8%	0.611	0.43
Asthma	3	4.1%	1	3.8%	0.002	0.96
CKD	1	1.4%	1	3.8%	0.611	0.43
COPD	6	8.1%	0	0.0%	2.243	0.13

TABLE 4. Comparison of mean values of Vital Parameters between Survivors and Non-survivors

Vital Parameters	Survivors		Non-Survivors		Z	P-Value
	Mean	SD	Mean	SD		
HR / Min	98.16	18.66	94.69	33.36	0.653	0.52
SHOCK INDEX	0.80	0.24	0.92	0.38	-1.830	0.07
RR (CPM)	15.68	5.51	22.65	10.74	-3.439	<0.001*
TEMP F	98.55	0.58	98.46	0.93	-0.777	0.44
MAP [mmhg]	91.74	21.65	77.04	36.24	-1.628	0.10
SPo2 AT RA	94.84	9.07	84.96	13.90	-3.828	<0.001*
GCS	13.66	2.86	10.85	4.54	-3.666	<0.001*

***abnormal RR, Spo2, MAP and GCS were associated with high mortality**

TABLE 5. Comparison of mean values of Laboratory Parameters between Survivors and Non-survivors

Laboratory Parameters	Survivors		Non-Survivors		Z	P-Value
	Mean	SD	Mean	SD		
GRBS (mg/dl)	145.15	81.49	153.00	88.29	-0.620	0.54
HB gm/dl	11.88	2.95	10.60	3.89	-1.258	0.21
WBC Count	11194.47	5813.23	14566.92	7885.39	-1.888	0.06
ESR	26.87	25.73	21.88	22.76	-1.053	0.29
Platelet Count	2.39	1.08	1.74	1.07	-2.490	0.01*
RBC Count	4.64	0.74	4.00	1.41	-1.692	0.09
B.UREA	33.82	23.69	61.81	53.43	-2.196	0.03*
S.Creatinine	1.12	1.17	2.46	2.45	-3.396	0.001*
S.NA	133.31	12.34	134.69	6.58	-0.481	0.63
S.K	4.05	0.79	4.69	0.99	-2.766	0.006*
S.CL	95.30	13.03	96.23	7.68	-0.260	0.80

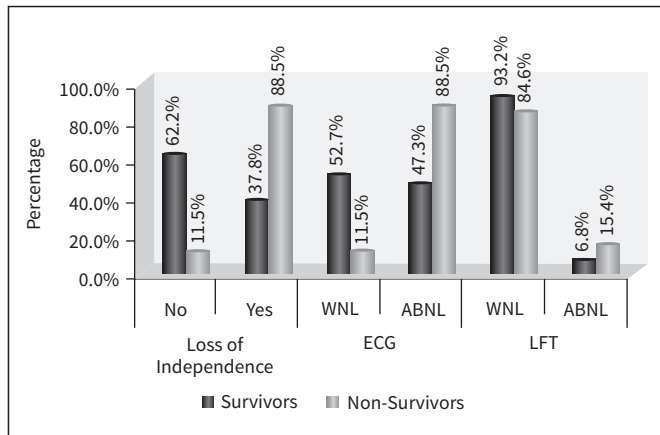
***abnormal platelet count, blood urea, serum creatinine, serum potassium levels were associated with high mortality**

TABLE 6. Comparison length of stay between Survivors and Non-survivors

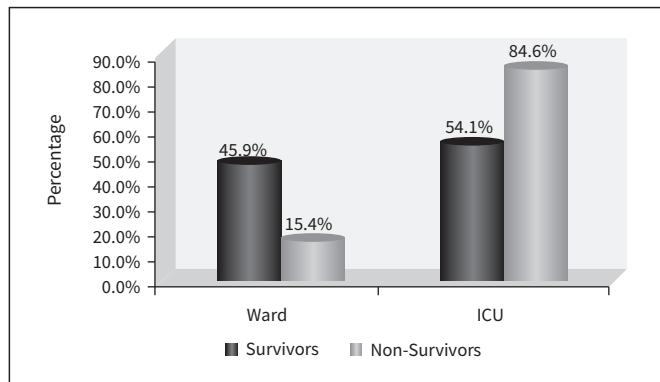
Prognostic Indicators	Survivors		Non-Survivors		Z	P-Value
	Mean	SD	Mean	SD		
LENGTH OF STAY	5.72	4.14	4.23	4.38	-2.781	0.005*

***non survivors were seriously ill at the time of admission and had less hospital stay.**

Graph 1: Comparison of Loss of Independence, ECG & LFT findings between Survivors and Non-survivors

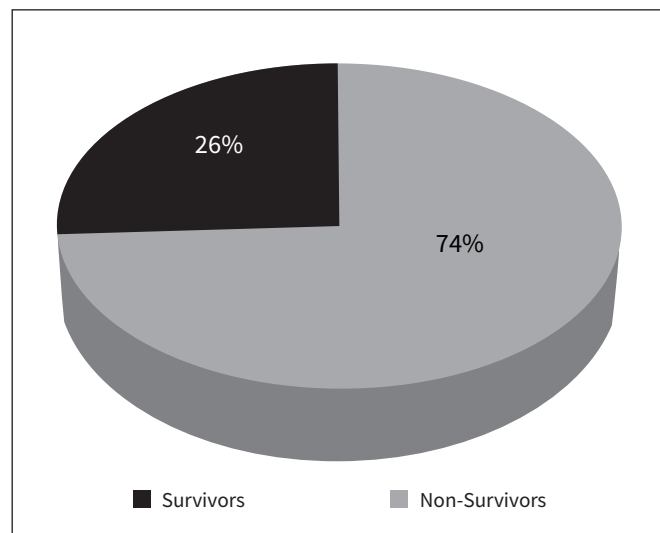


Graph 2: Comparison of Patient admission between Survivors and Non-survivors

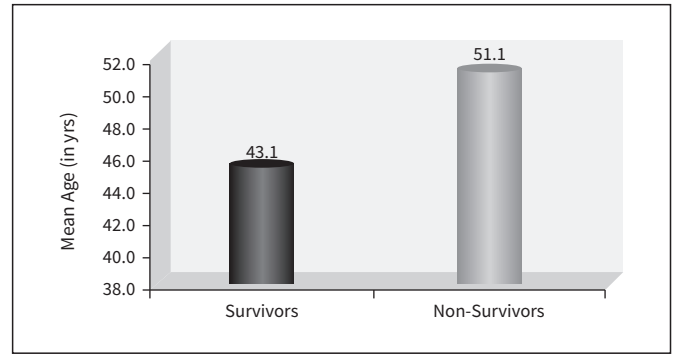


Majority of ICU admissions were in advanced state of illness, hence survivor proportion was less.

Graph 3. Distribution of study patients based on outcomes



Graph 4. Mean Age distribution based on the outcomes of the patients



Younger patients showed better outcome.

Discussion

Several studies revealed that there has been a consistent increase in the number of emergency department admissions over the last decade. The findings of the study are related to the characteristics, baseline clinical information, pattern, the spectrum of emergency department admissions, and outcome of adult emergency department (ED) admissions. This study compared with currently existing works of literature and presented briefly^[8].

A similar study was done in 2019 by Woyessa, A. et al^[9]. The mean age of the patients was 34.98 years. Respiratory distress (12.43%), extremity fractures (9.61%), and hypertensive disorders (8.6%) were among the top leading causes of adult ED admissions. Impairment of breathing (37%) was immediately identified as life-threatening problem, after effective care majority patient's discharged from hospital (90.9%). Males were predominant 56.60% and females accounted for 43.41%. The maximum number of subjects was in the age group of 25 to 55 years (61.10%). Regarding the duration of hospital stay, 58.2% of cases stayed for 1–3 days, the rest of 41.8% have stayed for 4–7 days. Overall mortality was 8.5% including ward and ICU admissions.

A study was done in 2019 by Rufus YB et al^[10]. Males were predominant (64%) and females accounted for 36%. Breathlessness was the most common complaint 1041 (44.6) followed by Chest pain 466 (20), Altered sensorium 452 (19.3), Abdominal pain 180 (7.7), and Others 621 (26.6). Males were predominant 64% and females accounted for 36%. The maximum number of subjects was in the age group of 15 to 59 years (59.16%).

In our study, males were predominant 53% and females accounted for 47%. The most common chief complaint was fever (n=37). The mean duration of hospital stay was 4.23 in non-survivors compared to survivor's 5.82. Ward admissions 38% compared

to ICU 68%. The majority of patients survived from hospital (74%) and mortality was 26%. The maximum number of subjects was in the age group of 20 to 60 years (63%).

The present study shows patients presented to ED with complaints like fever were higher in number than breathlessness, but it did not truly reflect the severity of the disease, as mortality was higher in patients with breathlessness. At the time of admission, Abnormal Vitals like respiratory rate >22cpm, SpO2 < 85% at room air, and GCS <11 along with Point of care investigations like ECG, RFT, Platelet count, and Electrolytes if abnormal were associated with poor prognosis, and guide to determine the level of care.

In this study patient demographics, clinical profile, and distribution of resources identified by this study can also help guide and shape Indian EM training and faculty development programs. Many primary and secondary health centers lack triage, trained personnel, and the necessary equipment to treat sick patients. Unlike in our hospital (tertiary care), specialists in traumatic and medical care are not available in most of the rural hospitals, and many patients are thus referred to higher centers before adequate resuscitation. Further multicentre study with large sample size will help to make a policy in the EM training program.

Limitation: The study was single-center and small sample size.

Conclusion: Patients admitted to the Emergency Department (ED) are highly heterogeneous in terms of disease spectrum and severity. The patient demographics and other characteristics identified by this study help us to guide better prioritization of care and resource allocation.

References

1. Subhan I, Jain A. *Emergency care in India: the building blocks. International Journal of Emergency Medicine.* 2010;3(4):207-211.
2. Sullivan A, Richman I, Ahn C, Auerbach B, Pallin D, Schafermeyer R et al. *A Profile of US Emergency Departments in 2001. Annals of Emergency Medicine.* 2006;48(6):694-701.
3. Ha D, Dang T, Tran N, Vo N, Nguyen N, Nguyen T. *Prognostic performance of the Rapid Emergency Medicine Score (REMS) and Worthing Physiological Scoring system (WPS) in emergency department. International Journal of Emergency Medicine.* 2015;8(1).
4. Hsia R, Nath J, Baker L. *California Emergency Department Visit Rates For Medical Conditions Increased While Visit Rates For Injuries Fell, 2005–11. Health Affairs.* 2015;34(4):621-626.
5. Raita Y, Goto T, Faridi M, Brown D, Camargo C, Hasegawa K. *Emergency department triage prediction of clinical outcomes using machine learning models. Critical Care.* 2019;23(1).
6. MZ K, Hansen H, BU A, s L. *A retrospective study of illness and admission pattern of emergency patients utilizing a corporate hospital in Dhaka, Bangladesh : 2006 -2008. The ORION Medical Journal.* 2009;32(2):650-653.

7. Taye B, Yassin M, Kebede Z. *Quality of emergency medical care in Gondar University Referral Hospital, Northwest Ethiopia: a survey of patients' perspectives. BMC Emergency Medicine.* 2014;14(1).
8. Forster A. *The Effect of Hospital Occupancy on Emergency Department Length of Stay and Patient Disposition. Academic Emergency Medicine.* 2003;10(2):127-133.
9. Woyessa, A., Dibaba, B., Hirko, G. and Palanichamy, T., 2019. *Spectrum, Pattern, and Clinical Outcomes of Adult Emergency Department Admissions in Selected Hospitals of Western Ethiopia: A Hospital-Based Prospective Study. Emergency Medicine International,* 2019, pp.1-10.
10. Chandy G, Rufus Y, Abhilash K, Swadeepa R, Koshy S. *Clinical profile and outcome of the patients presenting to the resuscitation room of the emergency department in a Tertiary Care Hospital of South India. Current Medical Issues.* 2019;17(2):25.

Conflict of interest: Nil

Source of funding: Nil

Date of submission: October 22nd 2020

Date of acceptance: December 14th 2020