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Restricted Analysis of Mortality in an Acute Care Facility of a Rural Hospital in Bengal, India

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Abstract

Advances in acute care medicine have increased the chances of survival for patients with severe illness or trauma. The major causes of modifiable and non-modifiable mortality among patients treated in medical or surgical intensive care units (ICUs) are trauma, sepsis, complications of diabetes mellitus type 2 and hypertension, respiratory support, CVA, electrolyte imbalance, poisoning and snake bite. Such analysis will give an insight into the various factors which led to death. The pre-hospital co-morbidities will reinforce the internist to anticipate and take appropriate measures to mitigate their onslaught. In this way, the mortality in the ICU may be curtailed.

Keywords: Acute care; Ventilation; Mortality; Sepsis; Diabetes; Hypertension; COPD; Trauma

Introduction

Advances in critical care medicine have increased the chances of survival for patients with severe illness or trauma [1]. However, such patients consume a large proportion of medical resources [2-5]. The factors for mortality that have potential to be modified among patients treated in medical or surgical critical care medicine (ICUs) (Figure 1) are sepsis, diabetes mellitus type 2, hypertension, poisoning and snake bite. Understanding the risk factors and their contribution to mortality would support the view that monitoring of patients with above factors is expected to prevent many deaths.

Subjects and Methods

Study population

Patients of both sexes and all ages admitted to the Critical Care Medicine Unit of Glocal Hospital, Krishnanagore were included in this study. Also included were patients transferred from the General Ward to ICU. Post-surgical cases requiring intensive care were also admitted to the ICU. There were no exclusion criteria. All patients admitted to acute critical care were interviewed. When required the patient party or accompanying personnel were interviewed. A thorough physical examination followed by relevant investigations was performed. CT scan, MRI, USG were performed in cases, particularly trauma cases and abdominal pain and other cases as required.

Informed consent

Informed written consent was obtained from all patients or close relatives. In case of children, informed consent was taken from parents.

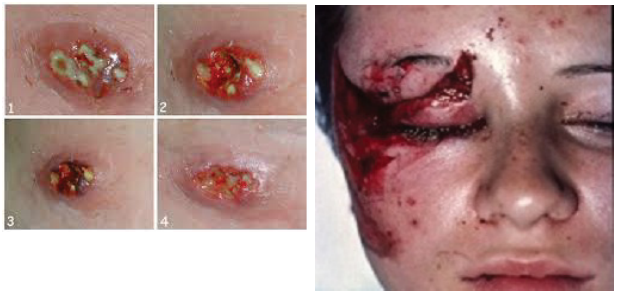

Figure 1: Patients treated in medical or surgical intensive care units (ICUs) for trauma, sepsis.

Study period

January 1st, 2016 to 31st December 2016.

Sample size

All patients admitted to ICU during one calendar year.

Statutory clearances

The Institutional Scientific Advisory Committee (SAC) and Ethics Committee (EC) cleared the project proposal.

Results and Discussion

Table 1 shows the distribution of admitted cases Vis-à-vis deaths, age groups, gender and month-wise admissions in the acute care unit of Glocal Hospital (ICU), Krishnanagore, India. A total number of 1130 cases of diverse diseases (males 432 and females 532) and 113 patients died. There were more females than males. A case fatality rate of 10% was recorded. Month-wise distribution of admissions showed that more than 100 cases were admitted in January, February, March and October, 2016, Highest number of cases died in the older age group (>60 years). There were no obvious admission and mortality trend month-wise.

On admission, the case acuity was high with majority of cases presenting to the Emergency (ER) with signs of hemodynamic impairment and sepsis (40%). While neurology deaths cases including CVA cases constituted about one-third of all ER admissions who needed airway protection on admission. Neurology deaths (20%) accounted for large numbers of Cardio Vascular Accidents (CVA) which were hemorrhagic in nature. Many of the neurology cases needed neurosurgical intervention (30%). Higher mortality was observed in cases those who presented with long delay to the ER, long time to

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Total Admission			Total Deaths					
Month	Sex							
	Male	Female	Total	≤ 18 yrs	19 to 45 yrs	45 to 60 yrs	>60 yrs	Total
Jan	85	44	129	0	2	2	8	12
Feb	103	57	160	0	2	1	7	10
Mar	111	60	171	0	3	5	2	10
Apr	46	10	56	1	3	1	3	8
May	38	29	67	2	4	2	4	12
Jun	37	22	59	0	2	0	3	5
Jul	40	29	69	0	4	3	4	11
Aug	49	34	83	3	2	1	3	9
Sept	43	32	75	2	2	1	1	6
Oct	80	29	109	2	3	2	3	10
Nov	48	41	89	0	2	3	6	11
Dec	47	16	63	0	2	3	4	9
Total	727	403	1130 (100%)	10 (8.8)	31 (27.4)	24 (21.2)	48(42.5)	113(10%)
Note: Case-fatality is 10% of total admission								

Table 1: Showing the numbers of cases admitted and deaths in the acute critical unit in Glocal Hospital, Krishnanagore.

Country	Percent mortality
India	12
West Bengal (Krishnanagore)	10
Singapore	7
USA/UK	2 to 6*
Note: *Pediatric age group	

Table 2: Comparing the mortality rate amongst some countries worldwide.

intervention, hemorrhage was directly proportional to the mortality (5:3). Endotracheal intubation on admission with hypotension was other risk factors for death.

AF was the commonest sustained arrhythmia in emergency (4%). DC cardio version was the preferred method of termination tachyarrhythmia in ER. In poisoning cases Parquet cases had a higher mortality (97%) than Organophosphate intakes. The major co-morbidities were diabetes mellitus type 2 and hypertension. The other factors that were noted in the ICU were sepsis, electrolyte imbalance and Venillatory support [6,7]. More deaths were associated with those who required Ventilation support in the ICU.

Comparing the mortality rate amongst some countries worldwide (Table 2). The national figure for death is about 12% and is dependent upon co-morbidities that were associated with the cases. As expected, the causal factors like diabetes mellitus type 2; hypertension, cardiac arrhythmias and most importantly ventilation support were associated with higher mortality. A study carried out in Singapore for a period of 5 years found a mortality of 7% [8]. In view of these important findings, we conclude that extra-ordinary monitoring is required for critical cases that belong to the categories mentioned above in ICU either alone or in various combinations. Overall, mortality rates in patients admitted to adult ICUs average 10% to 29%, depending on age and severity of illness. The pediatric mortality rate associated with sepsis is 25%, whereas the overall mortality rate for pediatric ICU patients ranges from 2% to 6%. The effects of advanced age per se versus severity of chronic and acute diseases of short and long term in survival of older patients admitted to the intensive care unit (ICU) remains unclear.

Conclusion

In context of a typical rural setting, a critical care unit could achieve a case-fatality rate of 10% as compared to 12% of national figure. Although the data depicts the picture of one ICU in a rural area in India [8,9], it is representative of the similar ICUs in most ICUs of rural India. This was possible because of adherence to modern guidelines for critical care of ICU [10]. This facility may be utilized for training purposes and theses' work.

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