Original Article

Audit of general intensive care unit of Bangabandhu Sheikh Mujib Medical University

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Abstract:

All patients admitted to the Intensive Care Unit of BSMMU between January 2006 and December 2006 on whom data had been entered into the study. A total of 473 admissions with complete records were available. Hospital mortality was 60.6%. Nonsurvivors were older than survivors and had longer ICU stays. Patients admitted from wards had a higher mortality than patients from the operating room / recovery or the emergency department. Thirty-four percent of patients were in the ICU for >2 days, and they accounted for nearly 81% of bed occupancy.

Early identification of patients at risk, both before admission and after discharge from the ICU, may allow treatment to decrease mortality. Research and resources may be best directed at patients who die, despite a relatively low predicted mortality. Many patients die after discharge from ICU and this mortality may be decreased by minimizing inappropriate early discharge to the ward, by the provision of high-dependency and step-down units, and by continuing advice and follow-up by the ICU team after the patient has been discharged.

Key Words: intensive care; BSMMU; audit, morality

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Introduction:

Intensive care is expensive and scarce worldwide including Bangladesh.[1] Total number of ICU beds in Bangladesh is about 190 for 150 million people. Therefore admission to the intensive care unit (ICU) should be restricted, so that patients likely to benefit from ICU care [2]. This restriction excludes patients whose death is inevitable as well as those patients who should survive and do well without the need for intensive care. Unfortunately, our postoperative care is based on isolation of patient only and minimum facilities are available. Therefore, surgical team and also patient's party preferred to shift his patient to the intensive care unit. Because, judicious use of fluids and blood products, management of cardiac output and blood pressure, control of temperature, provision of good analgesia, nutrition and respiratory support are only available in the intensive care unit. Admission to an intensive care unit allows close monitoring and early intervention if problems arise and thereby many surgical deaths can be prevented. There is no substitute for an adequate number of intensive care beds to which appropriate surgical patients can be admitted. The numbers of intensive care and hospital beds were not constant over this period; it varies from hospital to hospital and also from ownership. We have three corporate hospitals and allocation of bed for acute care varies. In UK recommendation that 1% to 2% of acute hospital beds to be ICU beds dates from the 1970s [9] and is recognized to be inadequate for most hospitals. They have also specified the number of intensive care consultant sessions indicating the degree of senior medical personel involvement in

running the ICU. One session approximates to one half day/wk of consultant "intensivist" time dedicated to the ICU. In the United Kingdom, the Intensive Care Society recommends a minimum weekly allocation of 15 consultant sessions to an ICU of more than 2 to 4 beds to cover daytime and out-of-hours commitments [10]. A minimum of seven fixed daytime sessions with a consultant dedicated to the ICU is required for training recognition. All of the ICUs are also staffed by doctors receiving training in intensive care. Most of these doctors are anesthesiologists on rotation. There is considerable variation between and within ICUs in the experience and training of these doctors and in the amount of supervision and responsibility they are given.

The working practices and outcomes from intensive care units are poorly documented in our country.

The patients were admitted in the Intensive Care Unit from different discipline of Bangabandhu Sheikh Mujib Medical University Hospital and also referred from other hospitals.

A prospective analysis of 473 patients admitted to General Intensive Care Unit of Bangabandhu Sheikh Mujib Medical University Hospital was conducted between January to December 2006. This audit was instituted to investigate retrospective review of stored data from the archive. Demographic details, referral source, admission time, admission diagnosis and outcome were recorded to provide data for future development of Intensive Care Facilities.

Materials and Methods:

We have studied retrospectively of 473 patients admitted to General Intensive Care Unit of Bangabandhu Sheikh Mujib Medical University Hospital in the year 2006. Ethical clearance was taken from the Departmental Ethical Clearance Committee of the Department of Anaesthesia, Analgesia and Intensive Care Medicine, BSMMU. In accordance of the criteria for analysis, data obtained from admission register and mortality record books and also from patients admission files were studied. We observed patient's mortality and male female ratio. We divided the total patients in three age groups, 10-44 years younger age group, 45 to 65 years middle age group and above 65 years. We also studied patients of different specialty referred to the ICU. We also observed relationship of mortality with organ (s) involvement. We categorised the patients as single, double and triple organ/system involvement and their relation with mortality. Duration of stay in the ICU was defined as the number of days between the ICU admission and discharge with a minimum stay of 1 day and also the duration of stay in days and their relationship with mortality.

Statistical analysis:

All data were plotted in a pre-design data collection sheet appropriate for the study. All data are expressed as simple mean or ranged. Statistical analyses were done by Students t test or chi square as appropriate using SPSS.

Results:

A total of 473 admissions with complete records were available. They were divided into three groups. Out of this younger age groups (10-44 years) were 175 in number, middle age group (45-65) were 175 and older age group (>65 years) were 123. Three hundred thirty six patients were male and 137 patients were female and the male female ration is about 2.5:1.

Table-I

Distribution of age and sex with their outcome of ICU admitted patient of BSMMU

Parameters		Numbers	Percentage
Age in years	10-44	186	39.32
	45-65	164	24.67
	>65	123	26.00
Sex	male	295	62.36
	female	178	37.64

Values are expressed as frequencies and percentage over column total

Overall mortality rates were 60.6 (473). Crude mortality varied widely by admission category, age of the patient, hospital stay and organ involvements. The numbers of nonsurvivors were highest who referred from other hospital than from the in patient department of BSMMU. Ward admissions had a much higher percentage of mortality rates (52.9%)

than patients admitted from either operating room / recovery area (22.3%).

There was highly significant difference ($p < 0.01$) between the mean age of survivors, 54 ±19 yrs, and non survivors, 63 ± 17 yrs. Percentage of mortality increased with increasing age, as did the percentage dying in the hospital after surviving a first ICU admission. In younger age (10-44 years) group out of total 186 patients, 96 patients died and 90 patients survived. In middle age (45-65 years) group out of total 164 patients, 114 patients died and 50 patients survived. In older age (>65 years) group out of 123 patients, 81 patients died and 42 survived.

Table-II

Patient source and duration of stay in the ICU

Characteristic	No of patient	No of death
Source of admission		
Patient referred from ward of BSMMU	203 (42.91%)	79 (43.64%)
Operating Room / Recovery Room	58 (12.26%)	7(3.86%).
Other than BSMMU	212 (44.82%)	95 (52.48%)
Duration of stay in ICU		
up to 7 days	284 (60%)	207 (48.6%)
8-14 days	77 (16%)	44 (10%)
>15days	65 (14%)	33 (7.75%)

Values are expressed as frequency. Within parenthesis are percentages over column total.

Table-III

Distribution of patient as department basis

Department	Total number
Neurosurgery	120 (25%)
Neurology	81 (17%)
Nephrology	54 (11%)
Oncology	5 (1%)
Others	213 (45%)

Values are expressed as frequencies. With in parenthesis are percentages over column total.

We also observed the duration of stay in ICU. maximum patients (284) stayed in ICU for around 0-7 days, 77 patients stayed for 8-14 days, 34 patients stayed for 15-21 days, 18 patients stayed for 22-30 days and 13 patients stayed for around 30 days and above.

There was a highly significant ($p < 0.01$) difference in the distribution of ICU stays between survivors and nonsurvivors. Of nonsurvivors, 45% were in the ICU for ≤1 day, 66% of deaths were within 3 days, and 75% of the deaths were within 5 days. Only 12% of nonsurvivors were in the ICU for >10 days. We also observed that patients came to this ICU from different specialty, but maximum patients amounting 200, came from neurological system which includes both neurosurgery and neuromedicine. Minimum 5 patients came with diagnosis of carcinoma involving multi-organ.

323 patients admitted in ICU with single involvement. Out of this, 179 patients died and 144 patients survived. 98 patients admitted in ICU with more than one organ involvement. Out of this 92 patients died and 6 survived.

Table-IV

Relationship between outcome and number of organ involvement

Parameters		No of patient	No of death	p value
Organ involvement	Single organ	323 (42.91%)	144 (43.64%)	<0.001
	Multi organ	98 (12.26%)	92 (93.87%)	

Values are expressed as frequency. With in parenthesis are percentages over column total. Statistical analysis is done by x^2 test.

Discussion:

Our analysis was based on total number of ICU admissions for the time period of one year. The data were gathered as a collaborative clinical ICU audit project. The method of data collection, training, and data validation is designed to minimize errors [3]. However, the information is likely to be most accurate for objective information, such as patient's location before ICU admission, ICU stay and mortality rates, which are used to support the main themes of this article.

In our country, by the time patients reach the ICU, it may be possible to identify those with a high risk of death but it may be too late to do much to influence the outcome of those who die within the first day or two of admission. Such patients include those patients with brain damage after trauma or anoxia, with terminal cancer, and with end-stage respiratory failure. Many of these patients will have had underlying pathology and physiology too deranged to respond to a short period of intensive care therapy. Much intensive care research is focused on treatments directed at sepsis, adult respiratory distress syndrome, and multiple organ failure, problems that occur primarily in the long-stay ICU patient. To appreciably decrease early ICU mortality, it may be necessary to intervene before ICU admission. There is some supporting evidence in high-risk surgical patients showing that optimization of physiologic values before surgery and ICU admission may decrease mortality[4].

Early intervention may improve survival, observed mortality may decrease but, since mortality prediction for ICU patients is based on the patients' status shortly before, or on admission to the ICU, predicted mortality will also decrease as physiologic abnormalities and arrest are prevented.

Our analysis provides little hope for early identification of long-stay ICU patients unlikely to survive. Although long-stay patients consumed a majority of the resources, our analysis could not clearly differentiate early between survivors and nonsurvivors, and this finding is supported by other studies [5-8]. Daily assessment, taking account of changes in the patient's physiology and treatment, may provide a means for earlier detection of poor outcome. One way of decreasing costs in the ICU is to refuse admission to patients for whom there is little chance of benefit. Consultation and planning before considering ICU admission may minimize the number of such admissions.

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