



Original Article

An Analysis of First 300 ICU Patients at Rajshahi Medical College Hospital

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Abstract

An intensive care unit (ICU) is a special part of hospital where expertise medical and nursing care has been provided along with monitoring and organ support. An analysis of first 300 patients was carried out to investigate retrospective review of data from ICU of Rajshahi Medical College Hospital (RMCH) Rajshahi. During this study period, the frequency of admission into ICU was more from medical discipline (49%) than other disciplines like surgical (42.33%), gynaecological, obstetric and other disciplines (8.66%). The incidence of survival was 56.69% from surgical, 44.21% from medical and 38.46% from gynaecological and other disciplines and mortality was 35.94%, 53.59% and 10.45% respectively. Occurrence of total ventilatory support provided in all disciplines was 68%. In other studies it was found that the ICU mortality varies between 15% to 44% depending on various factors like age, severity of diseases, length of stay and organizational capability of the ICU. The most prevalence of diseases admitted into this ICU was medical diseases, which were 25% and second prevalent diseases were head injury 20.66%. The incidence of immediate mortality within 24 hours was 42 %

Key-ward: Intensive care, Mortality.

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Introduction

An intensive care unit (ICU) provides special expertise support to the vital organ and utilizes the skill of medical, nursing and other staffs experienced in the management of the problem¹⁻². It not only improves the probability of patients with hopeless illness but also likes to improve in general level of medical and nursing care. The modern ICU has developed from the fusion of lessons learned from respiratory and coronary care with continued momentum provided by the clinical and technological development in resuscitation, pharmacological and mechanical circulatory support and advances in renal replacement therapy, respiratory failure, cerebral

oedema and multi-organ failure³. Intensive care today is a separate specialty and while some period of training in ICU is valuable to all specialties⁴, it can no longer be regarded as parts of anesthesia, chest or internal medicine, general surgery or any acute discipline². There is a worldwide increase in the demand for critical care services⁵.

Rajshahi Medical College Hospital Rajshahi is 530 bedded tertiary hospital of Bangladesh with some special centers like nephrology, orthopedic, neurosurgery and CCU for better management, close monitoring, organ support and early intervention of patients if required. There are one

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intensive care unit in this hospital and serves the critically ill patients belonging to various disciplines. Therapeutic decision made by the attending medical doctors or from the physicians of patient's originating department who review the patient daily. After office hours, care of the patients is delegated to the resident who is remaining in ICU and on-call specialists of Anaesthesiology & respective department. These medical staffs consisted from resident rotated from various disciplines. Nursing staffs of ICU are mainly intensive care nursing staffs rotated eight hourly. An admission into ICU is from one sources the wards and depends on bed availability. There are no formal defined entry criteria to enter into these ICUs.

A potential analysis was conducted from data of ICU of RMCH Rajshahi to find out the number of patients from various department admitted into ICU, to see the most prevalent disease admitted into this unit, the number of patient required ventilatory support, the mortality of the patients in this study period and immediate death of patients after admission into ICU.

Material and Methods

This study was carried out to analyze retrospective data of patients of ICU of RMCH, Rajshahi from August 2011 to March 2013 of first 300 patients. To fulfillment of the criteria of analysis; data were collected from record of ICU of RMCH, Rajshahi

and from patient's files. The number of patients admitted into ICU from various departments was found out from record book, the most prevalent department were categorized, the number of patients required ventilatory support were sort out, the survival and mortality rate were found out and immediate death of patients within 24 hours were classified separately.

Result

A total 300 patients were admitted into this ICU during this period, among them 147 (49%) were medical patients, 127 (42.33%) are surgical and 26 (8.66%) patients were gynaecological, Obstetrics and others discipline which shown to the table-I.

Table – I: Department -wise admission of study group patients in ICU

Departments	Total patients & percentage
Medical	147 (49%)
Surgical	127 (42.33%)
Gynae & Others	26 (8.66%)
Total	300

Incidence of survival and mortality rate of study group patients were depicted in Table-II, which showed that 56.69% and 43.35% from surgical , 44.2% and 55.76% from medical, 38.46% and 61.53% from gynaecological and others disciplines and total ICU survival and mortality were 49% and 51% respectively which shown to the Table-II

Table – II: Survival and mortality of study group patients of ICU

Total patients as Disciplines	Total No. of patients as discipline	Total survived	Total death
Surgical patients	127 (42.33%)	72(56.69%)	55 (43.35%)
Medical	147 (49%)	65 (44.21%)	82 (55.76%)
Gynae & Others	26 (8.66%)	10 (38.46%)	16 (61.53%)
Total	300	147 (49%)	153 (51%)

Number of patients provided ventilatory support in medical discipline were 98 (66.66%) in surgical were 85 (66.92%) and in gynecological and others

were 21 (80.76%) and total ventilatory support provided in all discipline were 204(68%) which were shown to the table-III.

Table – III : Discipline-wise ventilatory support of study group patients

Disciplines	Total no. of patients	Put on ventilator	Without ventilator
Medical	147 (49%)	98 (66.66%)	49 (33.33%)
Surgical	127 (42.33%)	85 (66.92%)	42 (33.07%)
Gynae & Others	26 (8.66%)	21 (80.76%)	5 (19.23%)
Total	300	204 (68%)	96 (32%)

The most prevalence of discipline admitted into this ICU during this period is depicted in Table-IV; where it was found that frequency of internal medicine like diseases were 75(25%), second prevalent diseases were neurosurgical patients 62(20.66%) and 3rd were post operative surgical patients 53(17.66%) and 4th neurological patients were 33 (11%).

Table – IV : Distribution of patient admitted in ICU as department basis.

Department	Total number
Medicine (Internal)	75(25%)
Neurosurgery	62 (20.66%)
General Surgery (Post Operative)	53 (17.66%)
Neurology	33 (11%)
Gynae	26 (8.66%)
Cardiology	14 (4.66%)
Paediatrics	14(4.66%)
Others	23 (7.66%)
Total	300

Incidence of immediate mortality of study group patients is depicted in table-V. This table illustrated that the patients who died within 24 hours were 35(42.68%) medical diseases where as total mortality within 24 hours are 64(42%).

Table – V : Incidence of immediate mortality

	Period		
	0-24 hours	25-72 hours	> 3days
Medical (82)	35(42.68%)	25	22
Surgical (55)	23(41.01%)	18	14
Gynae & Others (16)	6(09.32%)	5	5
Total	64 (42%)	48 (31.37%)	41 (26.79%)

Discussion

This analytic study was based on total first 300 patients who were admitted in this ICU for a

period of from August 2011 to March 2013 of first 300 patients. The methods of data collection and data validation designed to minimize errors⁶. The information which was collected to be most accurate for objective information, such as discipline of the patients, number of patients required ventilatory support, most prevalent discipline admitted into this ICU immediate death of patients and survival and mortality rate. The prevalence of admission into this ICU was more from medical discipline (49%) than that of other disciplines like surgical (42.33%) gynaecological, obstetric and other disciplines (8.66%) and this is the usual finding of general ICU of all hospitals(Table-- I). The study done CMH, Dhaka for the prevalence of admission in 1255 patients done from January 2007 to December 2009 also same as our study. Mortality in intensive care unit patients remains high in all hospitals. Severely ill patients may experience higher mortality rates when assigned to ICU⁷. It was found in one study at Singapore that the mortality rate was 26% in ICU and 42% in hospitalized patients⁸. In another study at France, it was found that mortality was 15% in ICU and 20% to 30% in hospitalized patients with substantial variations across studies⁹. In other different studies it was found that ICU mortality rate varies between 15 to 44% depending on the case mix, age, length of stay and organizational aspects of the unit and corresponding mortality in the hospitalized patients was 30 to 42.2%^{10,11,12}. A study done in CMH Dhaka, it was found that the incidence of mortality was more in medical discipline (46.14%) than surgical discipline (31%) and least in gynaecological and other disciplines (15.62%) and total ICU mortality rate was 39.69%¹³. Another study done in ICU Bangabandhu Sheikh Mujib Medical University, Dhaka from January 2006 to December 2006 Overall mortality of ICU admitted patient were 60.61%¹⁴. In our study, it was found

that the incidence of mortality was more in gynaecological and other disciplines (61.53%) than medical discipline (55.76%) and least in surgical discipline (43.35%) and total ICU mortality rate was 51%, which is comparable to other ICUs (Table -II).

The mortality in ICU increase due to higher patient-to-doctors and patients to nurses' ratio, which causes staff fatigue. Beside this, lack of modern monitoring appliance, lack of organ support facilities and delays in getting complex diagnostic tests also a cause of higher ICU mortality of first 300 patients of newly setup ICU in Rajshahi Medical College Hospital (RMCH). It was customarily practice in this hospital that the high risk patients were sent to ICU before death from any department. A Study done in CMH, Dhaka the incidence of ventilatory support provided as discipline wise was 51.73% in medical, 34.18% in surgical and 59.37% in gynaecological, obstetric and other disciplines and the total patients required ventilatory support was 45.34%. In our study period, the incidence of ventilatory support provided as discipline wise was 66.66% in medical, 66.92% in surgical and 80.76% in gynaecological, obstetric and other disciplines and the total patients required ventilatory support was 68% (Table - III).

But in other studies it was 70.30% to 76.30% for a period ranging from one to 34 days in ICU^{11, 15,16}. In this study it was found that requirement of ventilatory support as same as others ICUs (68% vs 70.3%). Number of patient admitted into this ICU was more of internal medicine related was 75 (25%), the second prevalent disease was head injury 62(20.66%) due to road traffic and other accidents and third discipline was post surgical 53(17.66%) and fourth discipline was neurology 33(11%) (Table - IV). But in one study it was mostly trauma related cases entity responsible for admission into the ICU, which constitutes 45.6%¹⁷.

In our country, by the time the patients reach into the ICU, it was identified that the patient remain in high risk or death, because of severe compromised physiological reserve and irreversible organ failure

and it may be too late to do much influence the outcome of those who die within 12 hours to 48 hours of admission. Such patients are head injury, severe hypoxia, end stage organ failure and terminal cancer¹⁴. In this study it was found that the incidence of medical disease related mortality rate within 24 hours was 35 (42%) out of 82 patients, head injury and surgical patient was 23(41.01%) out of 55 (Table-V). In this situation, physiological reserve and severity of acute illness could not be appraised within short period of time.

To decrease mortality in ICU, it is necessary to adopt admission criteria, develop speedy settlement of patient after admission in ICU, to utilize modern monitoring appliances, organ support facilities and early intervention by the trained doctors ('intensivist') who are familiar with stressful ICU environment. To decrease early mortality in ICU, optimization of physiological values before surgery or any procedure of high risk patients should be done¹. The provision of early enteral nutrition (EN) was associated with a significant reduction in mortality in trauma patients¹⁸. Recently surviving sepsis campaign (SSC) has introduced to reduce mortality of septic patients, which reduces the ICU mortality up to 25%¹⁹. An early anticoagulation therapy may reduce mortality for patients with acute pulmonary embolism²⁰. Staffing constitutes the greatest challenge to our ICUs; with only one consultant anaesthesiologist and a few supporting staffs with minimum organ support facility falls below the international standard. A more intensive staffing produces with high intensity physicians in ICUs in causing higher quality of care and reducing the mortality and shorter ICU and hospital stays²¹.

Intensive care is expensive and scarce worldwide including Bangladesh. 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. 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 physiology abnormalities and cardiac arrest are prevented. We can reduce the mortality day by day to increase trained dedicated doctors, nurses, technician, provide modern equipment & logistic support. Also provide adequate diagnostic facilities.

Conclusion

The modern monitoring appliances, including central monitoring system for vital parameters and organ support facilities should be available to reduce the ICU mortality. It is primarily necessary to optimization of patients to doctor ratio and patient to nurse ration to reduce the mortality rate of ICU. Finally the ICU should be run by the dedicated critical physicians who are psychologically familiar with this situation and developed endurance with ICU milieu and used to provide precise and aggressive treatment, monitoring and intervention of various emergencies which will also decreases the ICU mortality significantly .Our analysis provide hope to detection to reduce ICU mortality .

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