ORIGINAL RESEARCH PAPER
Volume-8 | Issue-9 | September - 2019 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

# INTENSIVE CARE UNIT ADMISSIONS AND OUTCOME TRENDS AT A TERTIARY CARE HOSPITAL – A RETROSPECTIVE REVIEW

**Anaesthesiology**

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## ABSTRACT

**BACKGROUND:** Intensive care unit of any hospital is the most important department managing critical patients and is extremely resource and man power intensive. The study was conducted with an aim of bringing about changes in practice and guidelines to improve outcome.
**METHODS:** All patients admitted from 01 Jan 2018 till 31 Dec 2018 were included in the study. Data pertainining to demography, ventilatory support and mortality outcome were recorded.
**RESULTS:** Total of 720 patients were admitted during the study period. Medical specialties had more number of cases (67%) than surgical specialties (33%). Mortality was higher among medical (40%) than surgical cases (26%). Overall mortality in our ICU was 35.8%.
**CONCLUSION:** Neurosciences contributed to major ICU workload. Positive outcome was better among surgical than medical patients. Overall mortality was slightly higher in our ICU than other ICUs of the same region.

## KEYWORDS

Intesi

## INTRODUCTION

The intensive care unit (ICU) of hospital is a unit where critically ill patients are managed. The main aim of providing ICU care is to limit morbidity and mortality in the sickest patients. Intensive care as a specialty is an essential part of any medical set up and is most resource intensive, it needs most skilled and dedicated staff, sophisticated equipment for advance monitoring and organ support system [1].

Intensive Care Units in the Government setup are funded by the government with no financial burden to the patients. Most of the ICUs are open and mixed, catering to different medical and surgical specialties. Published data related to patient morbidity and mortality in ICUs of tertiary care public hospitals is scanty. Audit of data related to ICU will help us improve services provided to the most critically ill patients and better our health policies.

This retrospective study was conducted to review the admission pattern and outcome of patients admitted to ICU of tertiary care referral hospital in North India over a period of one year from 01 Jan 2018 till 31 Dec 2018.

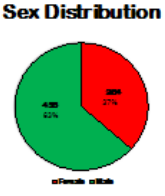
## METHODOLOGY

After obtaining the clearance from hospital ethics committee this retrospective study was carried out in 16 bed multispecialty adult ICU of a tertiary care hospital in Northern India. All the patients admitted to ICU over a period of one year from 01 Jan 2018 till 31 Dec 2018 were enrolled in the study. The data were collected by the nurse incharge, nursing technician under the supervision of the intensivist incharge of ICU, from the ICU record register, nurses report book and patients medical records. The data was analyzed by using Microsoft Excel 2007 and the Statistical Package for Scientific Solutions (SPSS) version 22.0. Proportions were calculated and Chi square test was used as a test for significance. A p value of less than 0.05 was considered significant.
The data recorded included the demographic profile of patients, specialty wise admission, length of ICU stay, number and duration of ventilatory support. Outcome variables recorded and analyzed were transfer/discharge of patients from ICU to wards or high dependency units (HDU) and mortality in ICU.

## RESULTS

Total number of 720 patients were admitted in the ICU during the study period. The source of admission were Accident and Emergency unit, referrals from smaller peripheral hospitals, Operation theatre and other wards of our hospital. Of all the admitted patients 264 (37%) were females and 456 (63%) were males. (Fig 1)

**Fig 1**




The mean age of the patients was 58 years. The youngest patient being 14 years and the oldest patient being 98 years. The demographic data is as shown in table 1.

**Table 1. Age-wise distribution and outcome of illness in the patients admitted in ICU**

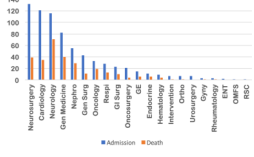
| Age in Years | Expired | Discharged | Total |
|---|---|---|---|
| 11-20 | 0 | 11 | 11 |
| 21-40 | 46 | 121 | 167 |
| 41-60 | 91 | 116 | 207 |
| 61-80 | 120 | 162 | 282 |
| 81-100 | 34 | 19 | 53 |
| Total | 258 | 462 | 720 |

| Chi Square tests | | | |
|---|---|---|---|
| | Value | Df | Asymp Sig (2-sided) |
| Pearson Chi Square | 52.012a | 9 | 0.000 |

A total of 480 (67%) patients were admitted as medical cases and 240 (33%) were surgical cases. Medical and surgical sub specialty wise distribution of the patients is as per Fig 2

Mean length of ICU stay was 8.7 days with a range of 01 day to 97 days.

**Fig 2 Subspeciality and the outcome of illness**



Total number of patients who required mechanical ventilation were 345 (48%) and 62 patients ware managed with noninvasive ventilation. Total number of ventilation days were 2810, average days of ventilation per patient were 8.14. Average number of patients on ventilator per day in the ICU were 7.69. The longest duration of ventilation was 64 days and the shortest being few hours (<1 day). Out of a total of 345 patients who required mechanical ventilation 166 (48.2%) improved and 179 (51.8%) died. None of the 64 patients who were put on elective ventilation died while on ventilator. Neurosurgery and Neurology accounted for almost 50% (170) of all the patients who required mechanical ventilation. A total of 462 patients were successfully shifted out of ICU to other wards/ HDU. 258 patients died in the ICU, the mortality was 35.8%. The mortality was higher in medical patients, 192 deaths out of 480 patients admitted (40%). For surgical patients it was 66 deaths out of 240 surgical admissions (26%). The gender specific mortality was lower among female patients (30.6%) compared to their male counterparts (38.8%). The mortality was highest in Neurology patients 63 out of a 116 admissions (54.3%). ENT, Faciomaxillary , Reconstructive and Urosurgery had zero mortality.

## DISCUSSION

Critical care as a subspecialty has progressed immensely in last decade and is continuously on a path of progress. The specialty has a long way to go in the developing world. In our country, there is an acute deficiency of ICU beds specially in government hospitals where the majority of population is treated. Patients managed in ICU require multispecialty support requiring intense monitoring, extensive tests and expensive medications. Our ICU being in a tertiary care super specialty hospital is well equipped to manage most of these cases, despite being a well-organized and equipped ICU and having dedicated staff including clinicians, the outcome of the patients admitted still remains poor compared to ICU in developed countries

The data in our study shows that majority of patients admitted to ICU were medical patients (67%), Neurology and cardiology accounting for almost 50% of all medical patients. In the surgical specialties Neuro surgery accounts for more than 50% of all the surgical admissions. These figures show almost the same pattern as observed by Subhash Prasad Acharya et al [2] in their study at a tertiary care center in Nepal in the year 2018. Study by Sushant Khanduri etal [3] from a tertiary care ICU also shows more number of medical than surgical patients admitted in ICU and in surgical specialties majority of admissions being from Neurosurgery similar to our study. Similar admission pattern is also enforced by a multi centric trial in ICUs across whole of India by JV Divatia etal in 2016 [4], they found majority of ICU admissions were medical cases with more severe disease process compared to surgical cases. One of the reasons for fewer surgical admissions in our ICU is that we have a Postoperative Surgical Unit (POSU), having facility for close monitoring and ventilating postoperative patients.

Out of total 720 admissions during the study period 462 (64.2%) patients had positive outcome and were shifted out of the ICU, 258 (35.8%) patients died. Among the subspecialties the mortality was highest for Neurology accounting for 63 deaths out of 116 admissions (54.3%). Neurology also had highest patients put on ventilator with more patients subjected to invasive procedures and prolonged ICU stay. In the study by Vaidya PR et al [5]on outcome of patients admitted in new ICU of Bir Hospital revealed a positive outcome in 63.05% of patients and another study by Koirala et al [6] showed successful outcome in 61% of patients, the outcome in both the studies are comparable to our ICU. Mortality figure of 35.8% are slightly higher in our ICU compared to the other two studies quoted with mortality figure of 28.7% and 26% respectively. The ICU mortality in study by Subhash Prasad Acharya etal [2] was observed to be 32.8% which is close to figures in our study. The mortality figures are slightly higher in our study compared to other hospitals in developing world probably because all these studies show about 8-9% patients leaving hospitals against medical advice and mortality figures for them are not included in their studies. No patients in our study left against medical advice.

In our study, overall outcome was better in surgical patients than medical patients with a mortality of 26% and 40% respectively. This was because most of the surgical patients were postoperative and were electively admitted and ventilated. Results of study by MHM Delwar Hossain et al [7], Vaidya PR etal [5] and Subhash Prasad Acharya etal [2] concurred with our study. Among all the specialties the mortality was highest in Neurology patients, 63 out of 116 (54.3%) patients best results were among postoperative patients who were electively ventilated accounting for 23 deaths out of 163 patients (14%) In our study 345 (48%) patients required mechanical ventilation and the mortality among ventilated patients was 179 (51.8%), the higher mortality in ventilated patients was because they were more sick and subjected to more number of invasive procedures which made them more prone to acquire infections. Our results were similar to study by Beatriz et al[8]and Vaidya PR et al [5].

### *LIMITATIONS OF THE STUDY*

The severity assessment of the disease process was not done at the time of admission hence no data pertaining to disease severity assessment were available. Our patients were not followed up after discharge from the ICU for long term outcome. Measures have been taken to introduce these parameters in record keeping and will be taken in to account in subsequent studies.

## CONCLUSION

Neurosciences patients including Neurosurgery and Neurology contribute to the major workload in ICU of our tertiary care hospital. Surgical and female patients have lower mortality and better outcome than medical patients and their male counterparts. The mortality in our ICU appears slightly higher despite almost same positive outcome compared to other tertiary care ICUs in developing world because no patients in our ICU left against medical advice.

**ACKNOWLEDGEMENTS** We would like to acknowledge the contribution of the Nursing in charge of our ICU along with other staff for making possible the data collection for the study.

**CONFLICT OF INTEREST** - None

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