Pattern of Patients in Intensive Care Unit in a Tertiary Care Hospital in Lumbini Province Nepal

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ABSTRACT

BACKGROUND

Intensive care is a crucial component of hospital care, reserved for patients with potentially recoverable conditions who can benefit from invasive treatment. However, in developing countries like Nepal, resources and availability of intensive care become hurdles in delivering healthcare. This study presents the pattern of admission and outcome of patients' management in a general intensive care unit (ICU) of this tertiary care center in Lumbini Province, Nepal.

METHODS

A cross sectional study conducted in the Department of Internal Medicine, Bheri Hospital between July 2021 to June 2022. A total of 792 patient's details were obtained from the record section. Demographic data, diagnosis, duration of stay in ICU, managing units, and outcome were collected and analyzed with Statistical Package for the Social Sciences 20.

RESULTS

A total of 729 patients were admitted in the study period; 57.82% were male and 42.18% were female. Majority 60% of admissions were from Department of Medicine followed by Cardiology 24% and Surgery 10%. Pneumonia and Chronic Obstructive Pulmonary Disease 18.30% followed by Myocardial Infraction 14.52%, Acute abdomen 10.22% and sepsis 9.84% were the most common morbidity. Mean duration of ICU stay was 3.5. days. Discharge rate was 69.82% and the mortality rate was 17.80 %.

CONCLUSION

The most common patients admitted in the ICU of Bheri hospital were mostly Medical cases. Surgical and obstetric cases were lesser in number. The outcomes were comparable with other multidisciplinary ICU of similar settings.

KEYWORDS

Intensive care unit; pattern of admissions; morbidity; mortality

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INTRODUCTION

Intensive care is a continuum of care from various source of admissions where patients' requiring a frequent assessment of vital signs, invasive hemodynamic monitoring, intravenous medications and fluid management, ventilatory and nutritional support to assure safe and effective outcomes.[1] An ICU has trained doctors and nurses who specialize in treating critically ill patients.[2] General ICU s are useful in resource poor setting because it accommodates all classes of critically ill patients thereby reducing the burden of running different specialty units.[3]

Common conditions that are treated in ICUs include severe neurological, cardiac, and respiratory diseases.[4] Mortality depends on various factors such as patient demographic, population characteristics, infrastructural availability, and type of illness, the quality of ICU care.[5] The average mortality in ICUs in Nepal varies, ranging from 15.2% to 39.3%.[6] These are relatively higher than ICU mortality rates in countries like the USA (11.3%), France (18%), Australia, and New Zealand (7%). [5]

This study aims to identify the disease burden at ICU of Bheri Hospital which is one of the busiest government run tertiary care center in the Lumbini Province. The identification of case patterns can be beneficial for efficient running and optimizing the limited resources available at the ICU.

METHODS

This was a hospital based retrospective cross sectional quantitative study done at Incentive Care Unit of Bheri Hospital, Nepalgunj. This study was conducted over a period of one year from July 2021 - June 2022. All the patients who admitted to Intensive care unit from Emergency department, Out-patient department, Cath lab and operation theatre were included in the study. Cases admitted in Neonatal ICU were excluded from the study. The ethical clearance was obtained from the ethical review board of Nepal Health Research Council (Reg no: 341/2022). ICU medical records were reviewed and demographic data like age and sex along with other data like diagnosis, duration of stay in ICU, managing units, and outcome were collected. Outcome was classified as discharge (shift out), referred, left against medical advice (LAMA), discharge on patient request (DOPR) and death. Data was collected on preformed proforma designed for the study. Data was analyzed using Statistical Package for the Social Sciences 20. Descriptive statistics like frequency, percentages, mean were used to describe the data. Results were reported in percentages, tables and charts for different variables according to nature of the variable.

RESULTS

A total of 729 patients were admitted in ICU during the study period out of which 458 (57.82%) were male and 334(42.18%) were female. Majority of admitted patients fall in age group 60+ accounting for 365 (46.08%) while least were 55(6.94%) patients in 0-15 age group as illustrated in table 1.

Table 1. Age wise distribution

Age Distribution	Frequency	Percentage (%)
0-15	55	6.94
15-30	77	9.72
30-45	73	9.22
45-60	222	28.04
60+	365	46.08
Total	792	100

The records stated that 614 (77.52%) patient were admitted from Emergency which was the majority in term of admission source. Rest were from Outpatient Department (OPD) and Cath Lab as shown in table 2.

Table 2. Admission source

Admission Source	Frequency	Percentage (%)
Emergency	614	77.52
OPD	69	8.72
Cath Lab	109	13.76
Total	792	100

Regarding the admitting Department, the majority of patients 479 (60.47%) were admitted into the ICU from Department of Medicine. Rest were from Cardio, Surgery and OBG department as illustrated in figure 1.

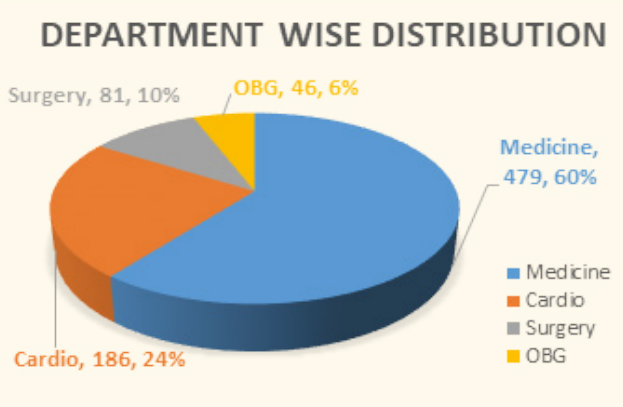

Figure 1. Department wise distribution

Respiratory cause like COPD and pneumonia 145(18.30%) were the most predominant causes of admission to ICU followed by MI 115 (14.52%), acute abdomen 81(10.22%) and sepsis 78 (9.84%). The morbidity with their mortality are given in table 3.

Table 3. Common Morbidity

Diagnosis	Number	Percentage (%)	Mortality	Percentage (%)
COPD, Pneumonia	145	18.30	31	21.98
Sepsis	78	9.84	24	17.02
Chronic Kidney Disease (CKD)	67	8.45	11	7.80
Infectious disease	18	2.27	03	2.12
Cerebro Vascular Accidents (CVA)	66	8.33	12	8.51
Snake bite	25	3.15	03	2.12
Poisoning	24	3.03	04	2.83
Sickle cell disease	56	7.07	00	00
Myocardial Infraction (MI)	115	14.52	22	15.60
Congestive Heart Failure (CHF)	71	8.96	12	8.51
Surgery (Acute Abdomen)	81	10.22	14	9.92
OBG (Pregnancy Related)	46	5.80	05	3.54
Total	792	100	141	100

Patients outcome were recorded, which showed 553 (69.82%) of them were transferred out to ward after success full management at ICU and 141 (17.80%) of patient had mortality. Outcome is shown in table 4.

Table 4. Outcome

Outcome	Frequency	Percentage (%)
Transfer Out	553	69.82
Refer	60	7.58
Death	141	17.80
Lama	38	4.80
Total	792`	100

The average ICU stay of patients were found to be 3.5 days in our study. In this study, we found the increasing trend of patient admission from the month of March up to June. Highest being admitted in June 2022 as shown in figure 2.

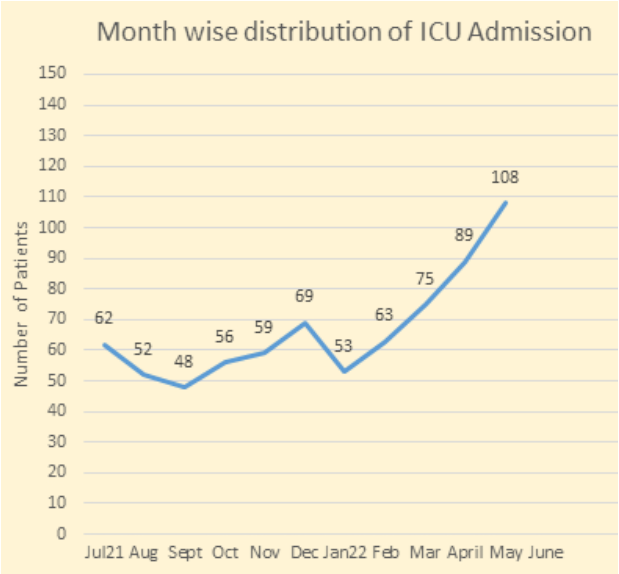

Figure 2. Month wise distribution

DISCUSSION

This study showed male predominance with 57.82%, which was similar with the study from Utarakhand, India (64.3%)[2], Nigeria (59%)[7], West Africa (54.4%)[8], Dharan(58.8%).[9] Majority of admitted patient in this study fall in age group (45 to 60) with 222 (28.04%) and 60 above age group with 365 (46.08%) while least were 55(6.94%) patients in (0 to 15) age group. This data was different from another study from Ethiopia where most of the cases were in between (20 to 60) age group with 65%.[10] However our data was similar with study from Uttarakhand, India with 68% of patients in the age group (20 to 70).[2] Another study from the Lagos university teaching hospital (LUTH) ICU, most of the admitted patients belong to the young and middle age group, the active and productive segment of the general population accounting for 66.9% (433) of all the ICU admission. Similar findings were reported from Jos university teaching hospital (JUTH).[8] Majority of the ICU admitted cases in our study were above the age of 45, this may be influenced by co morbidity like diabetes, hypertension, kidney disease and habits of smoking and alcoholism.

Our record show 614 (77.52%) patient were admitted from Emergency which was majority in term of admission source. Rest were from OPD 69 (8.7%) and Cath Lab 109 (13.7%). This was different from other study where the admission of patients were mainly from emergency operation theater (25%), routine operation theatre (23%), medicine ward (20%), emergency department (19%), surgical ward (4.3%) etc.[9] Our findings were similar with another study where most common source of patients to ICU was from emergency (48.5%) followed by high dependency unit (HDU) 24.2% and wards 18.3%. Only 9% patients were shifted from operation theatre.[2] While in another study maximum patients 49.2%

admitted to the ICU were from the operating theatre followed by 21.2% from accident and emergency unit.[5] This contradicts to our study.

In this study maximum number of patients admitted were from department of Medicine 60%, followed by cardiology 24%, surgery 10% and OBG 6%. The study from Uttarakhand, India had maximum number of patients 26.1% admitted under general medicine which was followed by neurosurgery 12.9%, general surgery 11.1%, pulmonary medicine 10.8%, neurology 7.8% and Rest 31.3% patients were from various departments like pediatrics, orthopedics, gynecology, cardiology, nephrology, gastroenterology, oncology, urology, eye and ENT.[2] Other study revealed 41.3% of the ICU cases belonged to medical cases and 45.3% surgical cases, and the rest remained unspecified.[5] This contradicted to our findings. Similar findings were also obtained in study where 38.8% cases were from Medicine, 49.8% surgery , 4.7% ENT , 4.3% OBG , 0.8% dental , 1.6% ortho.[9] However a study from West Africa revealed maximum admissions from Department of Neurosurgery 32% followed by Medicine 18.5%, OBG 15.5%, Surgery 13.9%.[8] This was due to the fact of availability of functioning Neurosurgical facility at that center. Similar findings were also noted in another study where department of General surgery 19%, Neurosurgury16.8%, OBG 18.4%, Neurology12.8%, Medicine 9%.[5] Trauma centers and Surgical oriented ICUs have least number of admissions of Medical and other cases. This was also seen in study from Nigeria where trauma related cases accounted for 39.4% of the total admission. Neurosurgery unit had the highest number of admissions 46.1% , with neuro trauma accounting for 78.4% of neurosurgical ICU admissions.[7]

Respiratory cases mostly chronic obstructive pulmonary disease and pneumonia was the most common cause of admission 18.30% followed by myocardial infraction 14.52%, acute abdomen 10.22%, sepsis 9.84%,CHF 8.96%, CKD 8.45%, CVA 8.33%, sickle cell disease 7.07%, obstetric cases 5.80%, snake bite 3.15%, poisoning 3.03%, infectious disease 2.27%. Medical and cardiac cases accounted the majority of the cases. Surgical and obstetric cases were around 16% of the total cases. Similar findings were seen in study from Pakistan where percentage of hepatic disease 12.9% was on rise among all admissions. The second most was the neurological insult cerebra-vascular disease 11.6%, followed by septic shock 10.4% and respiratory infections 9.5%, CNS infection 7.9%, along with congestive cardiac failure and pulmonary edema 6.2%, AGE with complication 5.8%, Acute coronary syndrome 5.4%, Kidney disease 5.4%, Surgical and Gynecological issues were 5.4% were the most leading cases in the study. Others were Cellulitis 0.8%, , Hypertensive Crisis 4.1%, Arrhythmias 0.8%, Diabetes with complication 2.5%, Carcinoma 0.4%, 2.1% Tb with complication, GI Bleed 3.3%, Heat stroke 0.4%, Poisoning 3.3%, Shock 1.2%, , and 0.4% (related to medical issues).[11] Another study was also consistent with our study where the most common specific diagnosis at ICU admission was all types of myocardial infarction 19% followed by Heart failure 11.1%, ARDS 8.9%, septic shock 7.3% and HIV infection 5% of the all admissions.[10] Surgical patients were the most admitted patients in the ICU mainly post operative cases of peritonitis, post operative monitoring, cancer operated patients and multiple trauma patients. Organophosphate poisoning and MODS were the most frequent medical cases showing typicality of a community based hospital in a developing country.[9] Acute abdomen 13%, Head injury 12%, Meningitis/ Encephalitis 11.7%, Sepsis/septic shock 7.6%, elective surgeries 7.3%. were the most common causes of admission which contradicts to the findings of our study.[12]

Multidisciplinary ICU can have wide range of admissions depending upon the speciality available. Our center is the only Government center having functioning Cath lab in Mid and far western Nepal, there fore cardiac cases are in majority. Moreover it is the referral center in this region thus we receive numerous critical patients of communicable and non communicable disease including MODS, Sepsis. This center is also referral center for snake bites from Banke and neighbouring districts like Bardiya, Kailali and Dang.[13] This center has trained physicians and Anesthesiologists capable of handling snake bite envenomations. More over insecticide poisoning has also been a public health problem in this region. It is one of the common cause of hospital admissions and mortality.[14] Sickle cell disease patients were also significantly admitted at this center. There is high prevalence of sickle cell disease in the Tharu community of Western Nepal. Most of the Sickle cell patients and carriers came from Bardiya, which is the second most populous district for Tharus in Nepal.[15] ICU admissions are required in Sickle cell disease patients with acute vaso-occlusive crisis, acute chest syndrome and those with co morbidity and requiring blood transfusions and quick monitoring.

In this study out of 792 admitted patients in the ICU, 141 (17.80%) of patient had mortality while 38(4.80%) were taken home by their families against medical advice and 60 (7.58%) were referred to other centers. Mortality in our study was higher than the mortality of a study from Srinagar India 9.4%,[16] while it was far lesser than that of studies from various centers of Ethiopia, where mortality was 38.7%, 10 39%,[17] and 37.7%[18] respectively. Similarly the overall mortality in-ICU was 41.4% in a study from Tanzania.[19] Another study from India had mortality of 28.6 % which is higher than the mortality data of our study.[2] However in a center with Neurosurgery facility overall mortality rate was about 39.4% with neurosurgery accounting for over half of total mortality 20.8%.[7] A study from Eastern Nepal showed the mortality of 26% and discharge rate of 61%.[6]

Our study with transfer out rate of 553(69.82%) and mortality rate of 141(17.80%) are at least comparable with multidisciplinary ICU within the country and even abroad. This reflects our ICU has been able to provide care of optimal quality. Trained nursing staffs and dedicated Medical officer for the ICU has been the key. Significant number of patients admitted in the ICU have being taken to home by their relatives against medical advice. Very critical patients and patients with multiple co morbidity , moreover due to financial constraints patients were taken back against medical advice. Mortality might have been raised if patients taken against medical advice was low. The ICU mortality rates vary depending on the case mix, age, length of stay and organizational aspects of the unit.[20] The severity of illness before ICU admission and presence of co-morbid conditions are significant factors in patient survival. Age and the duration of stay in the intensive care unit have been found to be inversely proportional to survival.[6,20]

CONCLUSIONS

Majority of cases admitted in ICU were medical cases consisting of respiratory illness followed by cardiac cases, sepsis, CKD, CVA and Sickle cell disease. Surgical and obstetrics cases were lesser as compared with medical cases. The outcomes of admission regarding the availability of resources were comparable with other multidisciplinary ICU of similar settings. Separate dedicated ICU for medical, surgical and other specialties will help to improve the critical care facility of the hospital.

Conflict of Interest: None.

Acknowledgement: None

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