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ORIGINAL RESEARCH ARTICLE

A CLINICAL AUDIT OF NEWLY ESTABLISHED INTENSIVE CARE UNIT IN THE FAR WESTERN REGION OF NEPAL

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ABSTRACT

Introduction: Intensive Care Unit (ICU) is a highly specified and sophisticated area of a hospital which is specifically designed, staffed, located, furnished and equipped, and dedicated to management of critically ill patients, injuries or complications. Most of the ICUs in Nepal are centralized in Kathmandu. ICU at Seti Zonal Hospital is the first one in the Far Western Region. This study aimed at an analysis of the structure, admissions, and outcome of this newly established. Methods: Data of all the patients admitted during the three month period (13th Feb 2016 to 13th May 2016 A.D.) were accessed from the patient records and reviewed retrospectively. Results: ICU at Seti Zonal Hospital is a four bedded unit lead by department of medicine. A total of 82 patients were treated in the ICU during the three month period of which 49% were females and 51% were males. The most common ailments were cardiovascular diseases followed by respiratory diseases. Of all the patients, 68% improved, 17% died 10% left against medical advice and 5% were referred to higher center. Patients with high mortality rate like polytrauma, head and thoracic injury were referred directly from the emergency room. Conclusion: Acceptable level of ICU care is possible at Zonal Level Hospital but it needs urgent upgrade to provide better critical care service in the region.

Keywords: Audit, ICU, Seti Zonal Hospital.

INTRODUCTION

ICU is highly specified and sophisticated area of a hospital which is specifically designed, staffed, located, furnished and equipped, and dedicated to management of critically ill patients, injuries or complications. In Nepal, we are in the initial phase of development of intensive care units though it has been decades since the first ICU was established in 1970 at Bir Hospital, Kathmandu. Nepalese government has now come up with the plans to develop ICUs in zonal and higher levels of hospitals. As per this plan, the government has recently established a ICU at Seti Zonal Hospital and has planned to establish more such units at other zonal and district hospitals.

More than 75 percent of hospitals in the country do not have any ICU, some 95 percent of government hospitals are also without ICU services and about 80 percent of ICU beds are centralized in the hospitals of Kathmandu Valley. ICU at Seti Zonal Hospital was inaugurated on 10th January 2016 AD by Honorable Minister of Health Mr Ram Janam Chaudhary.

We need to reflect upon the service provided and identify the problems associated with any service to execute plans of continual improvement. Audit is an important step in this regard. ICU audit is defined by the National Institute of Health and Care Excellence as "A quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Aspects of the structure, process and outcomes of care are selected and systematically evaluated against explicit

criteria. Where indicated changes are implemented at an individual, team or service level and further monitoring is used to confirm improvement in healthcare delivery."

ICU audit is an important initial step to identify the burning issues, problems, and quality of care provided to the patients and definitely helps to carry out, plan, and execute quality improvement programme. This is much more important in a set up which is just being operated. Therefore, this clinical audit of newly established ICU at Seti Zonal Hospital aims at analyzing the various aspects of critical care such as structure, profile of patients admitted to the unit, delivery of care and outcome of patients in a span of 3 months dating from 1st Falgun 2072 to 301st Baisakh 2073 BS (13th Feb 2016 to 13th May 2016 A.D.)

METHODOLOGY

Design and Sampling

This is a retrospective audit of the intensive care unit at Seti Zonal Hospital in the Far Western Region of Nepal for a period of three months from Falgun 2072 B.S. to Baisakh 2073 B.S. (13th Feb 2016 to 13th May 2016 A.D.). All the patients admitted to the unit during this time period were included in this audit.

Data Collection and analysis

Patient information was collected from the admission register in the unit. The data regarding clinical management of patients were also prospectively entered into a data sheet using Microsoft Excel Office Worksheet. ICU record books on consumables and equipment data were also reviewed. Data were analyzed using Microsoft Excel Office Worksheet and bar diagrams, line charts, and pie charts were generated. Data are presented as frequencies and percentages.

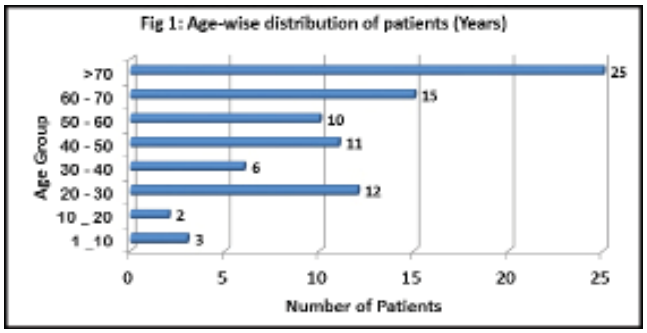
RESULTS

Intensive care unit at Seti Zonal Hospital is a recently established unit located on the second floor of the main hospital building. The unit has 4 beds each equipped with a bedside monitor. The unit has a total of 3 syringe pumps, 3 syringe pumps, and one electrocardiograph. It also has one mechanical ventilator, one portable X-ray machine and a portable ultrasound machine. It has a separate store of equipment and supplies. The unit is equipped with central oxygen supply with cylinder manifold and suction system.

It is an open model unit led by a consultant internist and a medical officer from the department of medicine who also look after the in-patient ward and out-patients. Surgeons, gynecologists, and pediatricians can also admit the needy patients in the unit who are managed as per their clinical advice and they are available on call. Nurse to patient ratio is 1:2 most of the time but at times a single nurse was posted in the unit. There were a total eight nurses, four of them trained for three months in the intensive care unit at tertiary level hospitals in Kathmandu after three years intermediate level of education in nursing.

The only laboratory at the hospital provides routine day time services only where complete blood count, renal function tests, liver function tests, urine routine and microscopic examination, routine cerebrospinal fluid, pleural and peritoneal fluid analysis, and qualitative cardiac enzyme essay are available. The laboratory does not provide any service at the night hours and there is no culture and sensitivity facility. The ICU does not have Arterial Blood Gas analyzer. Specialized blood investigations, computed tomography scan and magnetic resonance imaging are not done at the hospital.

A total of 82 patients (51% male and 49% female; Fig. 2) were admitted and treated in the unit in a span of three months of which a majority (47.56%) of patients were between twenty to sixty years with 30.48% of patients over the age of 70 years (Fig. 1). The youngest child was 2 years of age presented with hemorrhagic shock following accidental cut injury of right upper limb and oldest patient was a lady of 94 years suffering from severe pneumonia.



Most common cause of admission to the ICU was acute coronary syndrome followed by acute exacerbation of chronic obstructive pulmonary disease. Cardiovascular ailments including acute

coronary syndrome, dilated cardiomyopathy, heart failure, heart block, and arrhythmias constituted the majority of ICU admissions (29%; Fig. 3). Central nervous system diseases included meningoencephalitis (5 patients), cerebrovascular accidents (3 patients) and status epilepticus (2 patients). In gastrointestinal system most of the cases were surgical abdomen with severe sepsis needing exploratory laparotomy with one case presented with acute liver failure. Acute pancreatitis, upper gastrointestinal bleeding secondary to bleeding varices, and subacute intestinal obstruction were other gastrointestinal diagnosis. There were two cases each of eclampsia at term pregnancy and chronic kidney disease presented in pulmonary edema. Regarding poisoning three cases were organophosphorus and one zinc Phosphide poisoning. There was one case each of anaphylaxis secondary to ceftriaxone injection, polytrauma with flail chest, catatonic schizophrenia, septic shock with multiorgan dysfunction with unknown source of infection, electric burn, hemorrhagic shock with cut injury, and tension pneumothorax. Majority of patients were transferred out from ICU within 5 days (Fig. 4).

Critical care support provided to the patients during three months included monitoring, fluid, inotrope and vasopressure support, mechanical ventilation including non-invasive and invasive mechanical ventilation, and thrombolysis with streptokinase in a case of acute anterior wall ST elevation myocardial infarction.

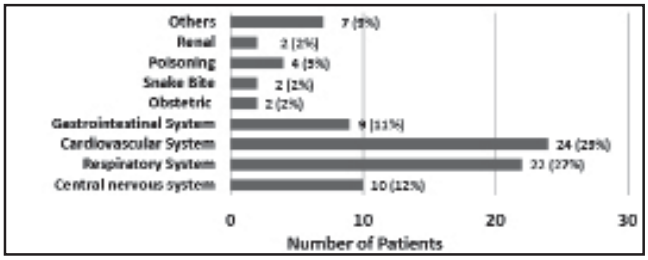


Figure 2: Disease distribution according to primary system involved.

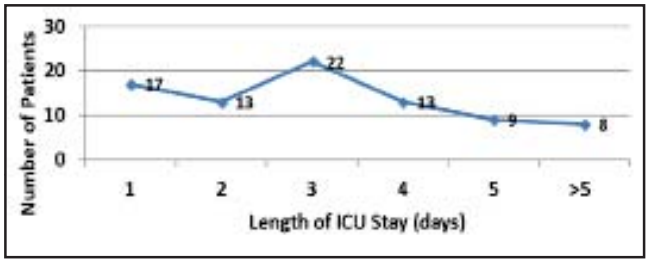


Figure 3: Length of ICU stay

Outcome of patients admitted to ICU

Regarding outcome of patients treated in ICU, 68 % patients survived and were ultimately discharged home. There were 2 readmissions, one for recurrent paroxysmal supravetnricular tachycardia and the other for acute exacerbation of COPD with pneumonia. Mortality rate was 17%. Eight patients left against medical advice and 4 patients were referred to higher center.

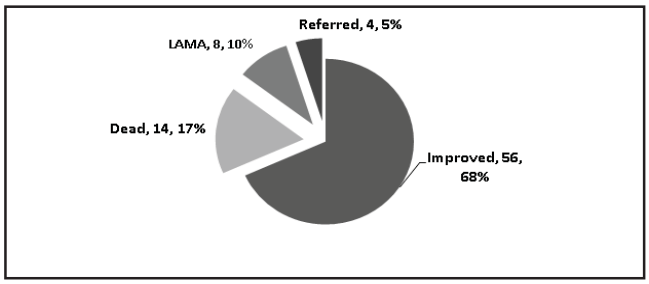


Figure 4: Outcome of patients admitted to ICU

DISCUSSION

Seti Zonal Hospital is in the center of the city of Dhangadhi with a population of over one lakh and is the only referral hospital with an ICU in the whole region consisting of two zones and nine districts with a total population of over 2.5 million a per 2011 AD census. This is indeed a big effort on the part of government to establish such an unit in the region. Looking at the figures of admission to and outcome of ICU patients, it's a great achievement in an effort to provide critical care service to 82 patients who would otherwise have been referred to higher center which is at least four hours drive from the hospital. But the unit still lacks adequate manpower including doctors, nurses, and allied staffs. The equipment including syringe pumps, infusion pumps, and ventilators are well below the needs of the unit which has nearly 100% bed occupancy rate.

Though studies have demonstrated single room for a patient to be superior in terms of safety , , , and sleep quality, this unit is a single room with four beds. But this should be acceptable at a place where there was no such unit at all and all the patients who required critical care support were referred either to India or Nepalgunj Medical College. Some of these patients died on the way, of which many might have been preventable deaths e.g. patients of snake bite with respiratory failure, organophosphate poisoning etc.

Patients admitted to the unit were not only from

Dhangadhi but also from all the districts of the far western region. Snake bite is particularly prevalent in most of the Terai district of Nepal and Far Western Region is not an exception. The snake venom, mostly being neurotoxic, rapidly leads to neuromuscular weakness and respiratory failure necessitating mechanical ventilation. During this audit period, two such patients were saved who might, otherwise, have been referred to higher center or died on the way if this ICU was not established; more such cases are expected to present to the hospital in the monsoon seasons.

Unlike the reports from most other developing countries, , , most of the patients admitted to our ICU were medical cases. This might be because of the lack of appropriate multidisciplinary surgical team to manage polytrauma, neurosurgical, cardio-thoracic and head and neck surgeries which usually require ICU admission.

Mortality rate is low in this audit compared to similar studies from developing countries. This might be because of selective patient admissions from the emergency department at the hospital because of various reasons. Firstly, patients with relatively high mortality rate like most of the road traffic accidents and fall injuries with polytrauma leading to moderate to severe head injuries, and thoracic injuries with hemodynamic instability were immediately referred to higher centers after initial stabilization because of lack of appropriate imaging facility, transfusion services and specialist manpower. Similarly, chronic kidney disease patients in need of immediate Hemodialysis were also referred to higher centers after initial stabilization.

Regarding patients leaving against medical advice, three patients were the cases of acute exacerbation of COPD with history of frequent hospital admission and poor baseline physical status with age above 70 years, one case was acute extensive anterior wall myocardial infarction in cardiogenic shock whom the family members did not agree to continue treatment at the unit and wanted to take patient to India for further management despite educating them about the risk involved, one patient was a case of pneumonia with septic shock with multiorgan dysfunction, one case was spontaneous intracerebral hemorrhage with low Glasgow Coma Scale and last case was patient with valvular heart disease in heart failure. Possible reason behind decision to leave against medical advice might be the lack of confidence and trust on hospital service and desire to take the patient to higher well equipped centers in India, poor financial status to bear the cost of drugs and equipment not available in government supply and desire to take the patient home at the end of life because of religious belief.

LIMITATIONS

It would definitely have been better if we could carry out an audit for a period of one year which was not possible because of missing data of patients. This three month-audit was possible with the tireless effort of the principle author as part of community posting of Doctor of Medicine in Critical Care Medicine Program of Institute of Medicine.

CONCLUSION

Despite very scarce resources, providing critical care service at a zonal hospital in far western region is possible with good outcome. But, being the only ICU in the whole region, the service needs urgent upgrades to more number of beds, manpower, and allied facilities including laboratory and imaging facilities and strengthen the blood bank service. There is also a need to establish the unit as a separately functioning unit with round the clock coverage by an intensivist.

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