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Assessment of Admission Pattern and Outcome among Patient Admitted to Medical Intensive Care Unit in Adama Hospital Medical College, Adama, Ethiopia

1. Yehuallashet Alemu yehumd2010@gmail.com (BSC, MD)
2. Godana Jarso godana.jarso@gmail.com (Associate professor, consultant internist)
3. NuruHassen nurulove27@gmail.com (MA in Social psychology, Assistant Professor)

Abstract

Back ground: -worldwide, intensive care units have significantly improved the quality of care and outcomes of critically ill Patients, mostly in developed countries. Non-communicable diseases are the leading cause of medical intensive care unit death globally.

Objective: Assessment of Admission pattern and outcome among patients admitted to Adama Hospital Medical College, intensive care unit from september1, 2016 to September, 2017.

Methodology: Retrospective review of 316 patient case notes who were admitted to Adama Hospital Medical College Intensive Care Unit from september1, 2016-september1,2017, pretested and structured checklist was utilized for data collection and data was entered by SPSS20, for variable having association binary and multivariate logistic regression were used and the study period was on 2018.

Results: From a total of 316 admitted patients to Medical intensive care unit, 197 patients are improved and discharged, 98 deaths with 31% mortality rate, 12 referral and 9 patients left against medical advice. Most commonly deceased age group were 25-34 which account 24(24.5%) followed by 35-44 and >65 age groups both account 17(17.3%). Most commonly admitted cases that lead to Medical intensive care unit death were severe head injury 17(17.3%), Congestive heart failure 16 (16.3%) and post-operative

12(12.2%) and there was statistically significant association between Diabetes keto acidosis, Congestive heart failure, Acute myocardial infection and Severe community acquired pneumonia and improvement.

Conclusion: Cardiovascular disease was the leading cause of admission and most common diagnosis that leads to intensive care unit death together with severe head injury. Diabetes keto acidosis, Congestive heart failure, acute myocardial infarction and severe community pneumonia a patient has statistically lower hospital mortality on multivariate logistic regression.

Key wards: Medical intensive care unit, outcome, mortality and intensive care unit

1. Introduction

An intensive care unit is an organized system for the provision of care to critically ill patients that provides intensive and specialized medical and nursing care, an enhanced capacity for monitoring, and multiple modalities of physiologic organ support to sustain life during a period of acute organ system insufficiency(1). Florence Nightingale is widely credited with the establishment of the precursor of the contemporary intensive care unit. During the Crimean War in 1854, she and a team of nurses created an area of the military field Hospital that could provide more intensive nursing care for the most severely injured soldier (2).

From the time of Nightingale to the mid-1950s, intensive care was primarily intensive nursing care. With the development of techniques of hemodialysis and the wide-spread introduction of mechanical ventilation after World War II, the contemporary model of the Intensive care unit began to take shape the modern concept of intensive care unit have been innovated by an anesthetist in Denmark Over half a century ago during the polio pandemic (1,2). Since then, worldwide, intensive care units have significantly improved the quality of care and outcomes of critically ill Patients, mostly in developed countries (2).

The ability to perform continuous monitoring of patient physiologic status is a key factor differentiating intensive care from ward-based Hospital care. Monitoring may be noninvasive transcutaneous oxygen saturation, noninvasive monitoring of heart rate and blood pressure, or continuous electrocardiogram or electroencephalogram monitoring or invasive hemodynamic monitoring, monitoring of intracranial pressure. Data should be continuously displayed so that they are readily accessible to all involved in caring for the patient, and recorded so that clinicians can monitor trends and respond appropriately (3).

In sub-Saharan Africa the availability of intensive care unit services is limited by a variety of factors, including lack of financial resources, lack of available technology and well-trained staff(4).Patients requiring intensive care may require support for instability (hypertension/hypotension), airway or respiratory compromise (such as ventilator support), acute renal failure, potentially lethal cardiac arrhythmias, or the cumulative effects of multiple Organ failure, more commonly referred to now as multiple organ dysfunction syndrome(4,5).

They may also be admitted for intensive/invasive monitoring, such as the crucial hours after major surgery when deemed too unstable to transfer to a less intensively monitored unit. Intensive care is usually only offered to those whose condition is potentially reversible and who have a good chance of surviving with intensive care support. A prime requisite for admission to an intensive care unit is that the underlying condition can be overcome (5).

Since good quality care for critically ill patients relies more on the availability of adequate medical staff, immediate diagnostic studies, early therapeutic Procedures, and appropriate treatments, the "week-end effect" on Hospital mortality was expected to be stronger for patients admitted to intensive care units than for those admitted to wards(6).

Critically ill patients are usually treated in the intensive care unit where the Hospital highest mortality rates occur (7). Critically-ill medical patients have a high mortality rate in intensive care unit. Critically ill patients are medically complex and may benefit from a multidisciplinary approach to care. Over four million intensive care unit admissions occur annually in the United States each year (8).

These patients are often at high risk of death (mortality) for critical illness syndromes such as lung injury and sepsis ranges from 25% to 50% and 20% of Americans die with intensive care services. Intensive care unit around the world, admit critically ill patients for advanced organ support with the goal of improving patient outcomes.   Early identification and management of patients having the highest risk of death may contribute to better understanding of these injuries and their outcome (9, 10).

Despite the advances in modern medicine and intensive care, the incidence of sepsis in intensive care units continues to rise. In an international study of 1265 intensive care unit, 60 percent of

intensive care unit patients at the time of survey were considered infected, with infection being a strong independent predictor for mortality. The risks of infection in general and with a resistant pathogen in particular increased with the length of patient stay in the intensive care unit. Several factors contribute to the high incidence of these infections in intensive care unit and the associated poor patient outcomes (11).

Non-communicable diseases, including cardiovascular diseases, are the leading cause of medical intensive care unit death globally, and the burden of disease is rising fastest among Lower-income countries. Cardiovascular diseases increased greatly in Ethiopia from 18% to 46% of all medical intensive care unit admissions over the last 30years (12).Intensive care medicine is a developing discipline in almost all low developed countries. Financial restraints due to inadequate insurance and national health systems together with severe logistic and educational problems account for high morbidity and mortality rates in Intensive care unit of low developed countries. More studies on the current state of intensive care medicine in low developed countries are needed to provide reasonable aid to improve the care of the most severely ill patients in the poorest countries of the world (12, 13).

The purpose of this study is to assess admission pattern and outcome among patient admitted to medical intensive care unit, for assessment of admission pattern and outcome among patient admitted to medical intensive care unit in Adama Hospital Medical College.

2. OBJECTIVE OF THE STUDY

2.1General Objective

The general objective of this study is assessment of Admission pattern and outcome among patients admitted to Adama hospital medical college, intensive care unit from september1, 2016-september1, 2017.

2.2 Specific objective

- To assess admission pattern of patients admitted to Adama hospital Medical College, intensive care unit from september1, 2016-september1, 2017.

- To determine outcome of patients admitted to Adama hospital medical college, intensive care unit from september1, 2016-september1, 2017.

- To identifies associated factors with mortality among patient admitted to Adama hospital medical college, intensive care unit from september1, 2016-september1, 2017.

3. Methodology

3.1. Study design –cross sectional study design was conducted to assess admission pattern and outcome among patient admitted to medical intensive care unit from september1, 2016-september1, 2017, Adama, Ethiopia.

3.2. Population - To assess admission pattern and outcome among patient admitted to Medical intensive care unit all patients visiting Adama Hospital Medical College from Adama city and outreach during the study period area are the target population.

3.3 Study population

The source population to attain objective of the study was a total of 316 cases that their medical history was recorded on patient admission book from september1, 2016 to september1, 2017, Adama, Ethiopia.

3.4 Data collection and management

Two data collectors were trained on how to collect the required data from medical records or chart of patient by using pretested checklist and the principal investigator was supervise during data collection to check the completeness of data and to maintain consistence.

3.5 Data processing and analysis

The collected data was coded, edited and analyzed by spss 20 and data cleaning were considered and any error identified was immediately corrected. The entire output from the software was analyzed by using p. value; frequency and the result were displayed by figures and tables. Statistical analyses like logistic regression were used to see association for each independent variable and for those with significant p. value multivariate logistic regression were used.

3.6 Ethical considerations

Ethical issue was considered in each steps of the study. Before commencing the study ethical approval was taken from Adama hospital medical college, public health department.

3.7. Dissemination and utilization of results

The finding of the study was disseminated to Adama hospital medical college and zonal health office to update the available information and use for intervention. In addition the copy of these studies was reserved in Adama hospital medical college as a reference for other students.

4. RESULT AND DISSCUSSION

4.1 Result

Table 1: Distribution of socio demographic characteristic of admitted patient to Medical intensive care unit and death rate from september1, 2016-september1, 2017, Adama, Ethiopia.

Age category	Frequency	Percent	Death rate (%)
Less than five	1	0.3	0
5-9	1	0.3	1
10-14	6	1.9	1
15-19	20	6.3	4
20-24	34	10.7	12.2
25-34	67	21.1	24.5
35-44	49	15.4	17.3
45-54	41	12.9	13.3
55-64	48	15.1	9.2
>-65	49	15.4	17.3
Total	316	100	100

Sex

Male	163	51.6	55.1
Female	153	48.4	44.9
Total	316	100	100

Most commonly admitted age group of patents were 25-34 which account 67(21.1%), 35-44 and those greater than 65 both account 49(15.4%) and the least were those less than 5year and 5-9 years age groups both account 1(0.3%).Mean age group of admitted patient was 40.9.

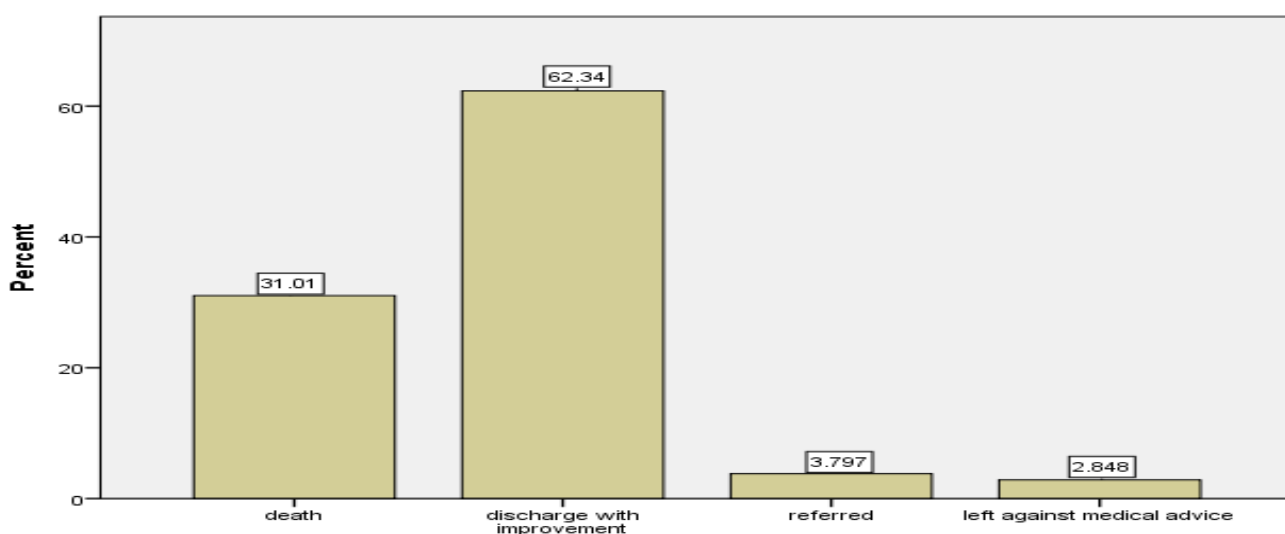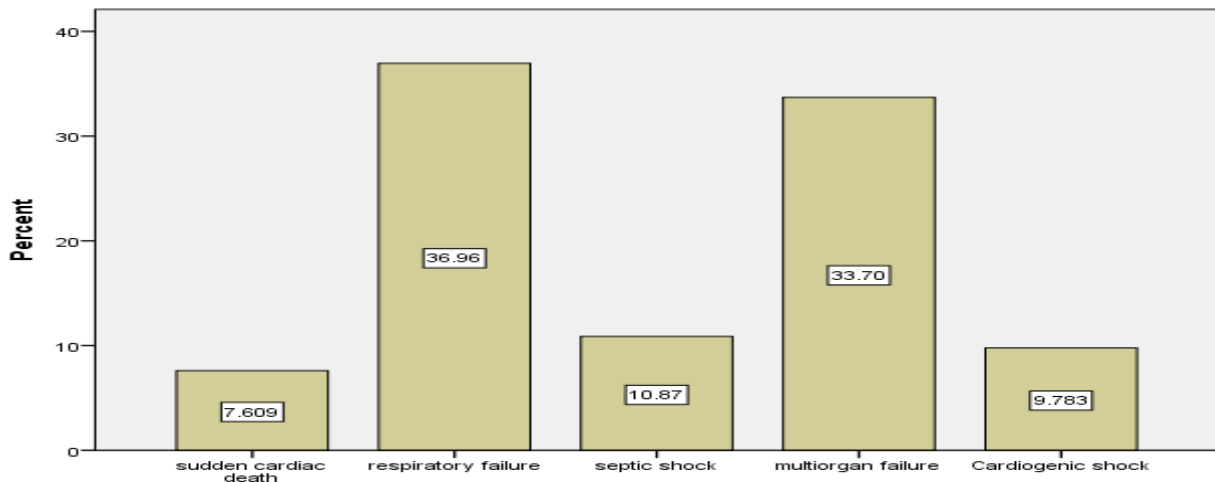**Fig .1-Prognostic outcome of patient admitted to Intensive care unit room**

Fig 1 shows from the total of 316 admitted patients to intensive care unit, 31.01% died, (62.3%) of them discharged with improvement, 3.79% referred to higher service and (2.8%) left against medical advice.

Fig.2-Medical intensive care unit Immediate cause of death

The immediate cause of death in intensive care unit from september1,2016- eptember1, 2017 was respiratory failure and multiorgan failure predominantly followed by septic shock and the least one is sudden cardiac death.

4.2 Discussion

This study was conducted to assess admission pattern and outcome among patient admitted to Medical intensive care unit and a total of 316 cases were admitted to intensive care unit, from this 163 (51.6%) are male and 153(48.4%) are female. From a total of admitted cases, 197 patients discharged with improvement, 12cases were referred, 9 were left against medical advice and 98 deaths with overall mortality of (31%), this was higher than study done in France which shows overall mortality at intensive care unit were 15%(17), this could be due to their intensive care unit setup has good quality, difference in character of population getting service and availability of appropriate patient selection criteria. Again its slightly higher than study done at Jimma university specialized and teaching Hospital in Ethiopia intensive care unit which shows overall mortality was 28% (18), this is explained by in both study site there were similar characteristic of population getting service as well intensive care unit is not well equipped with necessary facilities and there were no proper patient selection criteria to admit to intensive care unit which increase death to this intensive care unit.

According to this study most commonly admitted cases were congestive heart failure 65(20.3%),acute myocardial infarction 54(17.1%),post-operative patient for various reason 32(10.1%) and the least admitted cases were acute respiratory distress syndrome and pulmonary thromboembolism both account 8(2.5%) this is different from study done, in western Africa which shows, Common diagnosis that lead to intensive care unit admission where infectious disease 32 (51.6%),disease of cardiovascular origin 21(30.4 %), followed by surgical intervention for various reasons 13(18.8%) and respiratory tract infection 8 (11.6%) [15] This difference is could be due to government give due attention to communicable disease and different character of the population getting service. In other similar study done, in the St. Paul's Hospital Millennium Medical College in Ethiopia shows the most common Admission to the Medical intensive care unit of St.pawel millennium college were diabetics ketoacidosis (14.6%), stroke (8.3%), Acute myocardial infarction (8.2%) and NYH class IV stage c CHF (5.2%) (18).This similarity is probably due to that the Ethiopian government give due attention to communicable disease than non-communicable disease, people sedentary living style and similar characteristic of population getting service from both site.

According to this study most admitted patient were those at age group of 25-34 which account 24(24.5%), 35-44 and those greater than 65 both account 17(17.3%) with mean age of 40.9 and similar study done at Black lion Hospital shows Patient admitted to SICU ranged from 1 to 89 years of age with mean age at admission was 33.3 with 53(29.7%) of the patient were in the group 21 to 30 followed by 30 (16.8%)patients from 11 to 20 age group(18), this similarity is might be due to this age groups were more vulnerable to different accident like fighting, Road Traffic Accident and similarity of the population getting service from this site.

The most common disease entity that leads to intensive care unit death were severe head injury 17(17.3%), CHF16 (16.3%), post-operative for various reason 12(12.2%), myocardial infarction 11(11.2%), stroke and poison both of them account 9(9.2%) and the least were Retro viral infection and Pulmonary thrombo embolism both account 2(2%),this is different from study conducted in Austria which shows, the most common cause of death in patients admitted to intensive care unit were septic shock(53.3%),sepsis(17.5%) and infection(10.1%)(16)this is might be due to characteristic of the population can vary as well living style play a role. Other study conducted on similar topic in black lion hospital shows Stroke is the leading cause of death

accounting for 69 (15.8%) of total death followed by Congestive Heart Failure (13.8%), Acute Myocardial Infection(8%), severe pneumonia (6.9%), HIV/AIDS (6.4%), and sepsis (4.6%) (14), this result all most similar to current study this is might be due to similar character of the population using service and sedentary living style of the people.

According to this study Congestive heart failure, Diabetes ketoacidosis, Acute Myocardial infarction and Severe Community Acquired Pneumonia patents has lower Hospital mortality at p. value of less than 0.05 with 95% confidence interval; this is Similar with study done in China which shows that there were, patients admitted for heart diseases had significantly lower Hospital mortality (OR=0.31; 95% CI=0.11–0.86) (6), both studies were retrospective in nature.

According to this study the most common immediate cause of death is respiratory failure 34(10.8%), multi organ failure 30(9.5%), cardiogenic shock and septic shock both of them account 10(3.2%) followed by sudden cardiac arrest 8(2.5%),this is different from study done in Austria which shows immediate cause of death were multiple organ failure (47%), Refractory cardiovascular failure (17.8%), sudden cardiac arrest (4.2%), Pulmonary failure (1.1%)(14),this difference is probably due to shortage of resource at intensive care unit like mechanical ventilator and different character of population getting service. Other similar Study done at Black lion teaching Hospital in Ethiopia shows immediate causes of intensive care unit deaths were 143(32.8%), 104(23.9%) , 96(22%) and 70(16.1%) respiratory failure, shock, multi-organ failure and cardiovascular failure respectively(14). This similarity is might be due to poor intensive care unit quality at both site and those patient have the same socio demographic characteristics.

5. CONCLUSSION

Thus in this study mortality rate at MICU was 31% from this most commonly admitted patient that leads to intensive care unit death were severe head injury, post-operative patients for various reason and cardiovascular complication and the most common immediate cause of death were respiratory failure, multi organ failure and cardiogenic shock. Male sex and 25-44age group and those ages greater than groups are commonly died.

Most admitted patients have deranged vital sign with affected mental status. Duration of stay at intensive care unit for majority of them is 1-5 days before they died and some of them stayed for15-20 days. Actually those patients admitted to intensive care unit are critically ill and they need more time to be improved.

After all this, intensive care unit is the first experience in history of Ethiopia, only found in oromia regional state, needs due attention from the government to increase the quality and quantity of service and the study done in this area led foundation as a the base line for the coming researchers.

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