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DETERMINANTS OF OUTCOME IN ELDERLY PATIENTS ADMITTED TO MEDICAL ICU: A CROSS SECTIONAL STUDY FROM A TERTIARY HOSPITAL IN SOUTH INDIA.

General Medicine

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ABSTRACT

INTRODUCTION: Increase in the life span has increased the emphasis being given to improve the quality of disease assessment and management in the elderly, especially since the elderly have a higher incidence of illness and need for recurrent hospitalizations.

MATERIALS AND METHODS: This study is an observational study and was conducted in the ASRAM Hospital ICU with 242 sample size taken including all elderly people (Age > 60) who were admitted to the medical ICU.

RESULTS: Patients age greater than 75 is associated with increase in mortality in elderly admitted to medical ICU. Use of ionotropes and Ventilators are associated with increase in mortality in elderly patients above 60 years of age to medical ICU. No statistically significant association between length of ICU stay and mortality was found among elderly patients above 60 years of age admitted to medical ICU.

CONCLUSION: In our study conducted on the elderly critically ill medical patients, we found that age greater than 75 was associated with increased mortality.

KEYWORDS

Type 2 Diabetes mellitus, Hypertension, Hypothyroidism, Chronic kidney disease-,Dementia, Hospital acquired infection, sequential organ failure assessment score, Simplified acute physiology score, Ventilator-Intensive care Unit.

INTRODUCTION

Two decades ago, the prevalent view of aging was highly pessimistic and the opinion was that, 'as more and more old people would be kept from dying, there will be consequent adding up of the older people disabled by disease.This quantitative increase in the life span has increased the emphasis being given to improve the quality of disease assessment and management in the elderly, especially since the elderly have a higher incidence of illness and need for recurrent hospitalizations.

There is scarcity of studies done on Indian elderly population, reasons for which may be attributed to the lower life expectancy and the lack of established specialty geriatric care facilities and the lack of trained geriatric physicians. Medical ICU admissions of elderly people in India is showing an upward trend with more critical care facilities being available, but, it is still less as compared to that in the West.This study is a small and sincere effort to identify the clinical characteristics that influence the outcome in critically ill elderly patients admitted to the medical ICU.

AIMS AND OBJECTIVES

To determine the clinical characteristics (severity of illness scoring index, mechanical ventilation, inotropes, premorbid conditions,length of ICU stay) associated with mortality in patients older than 60 years admitted to medical ICU.

MATERIALS AND METHODS

Study setting:

Alluri Sitaramaraju Institute of Medical Sciences is a 1100 bedded multispecialty hospital which has a 100 bedded ICU facility which caters to both surgical and medical specialties. Most of the admissions to the ICU are medical emergencies like sepsis, COPD exacerbations, ARDS, pulmonary embolism, cerebrovascular accidents and myocardial infarctions..This study is an observational study and was conducted in the ASRAM Hospital ICU between June 2017-July 2018.

Study population:

All elderly people (Age > 60) who were admitted to the medical ICU fulfilling the inclusion criteria andconsenting for the studywere enrolled into the study.

Inclusion criteria:

All adults >60 years who are admitted to medical ICU from emergency and wards.

Exclusion criteria:

Patients who were admitted with surgical issues.Patients who have been referred or transferred after initiationof treatment at another ICU facility.

Sample Size : At 80% power and 95% confidence interval, the sample size is calculated as follows:

Mortality in medical ICU elderly patients	**19.6%**
Sample size	**246**

Methodology:

All the patients > 60 years admitted to the medical ICU who satisfied the inclusion and exclusion criteria were included prospectively in the study. The following information was recorded for each patient included in the study, on arrival to the medical ICU, On admission the parameters recorded were -- Age, gender, and primary reason for ICU admission, past medical history / co-morbidities and functional status prior to illness (using activity of daily living index). Along with this vital measurements and clinical status of the patient were recorded.

Simplified acute physiology scoring-II (SAPS-II) was calculated for all the patients. The presence of any focus of infection (as determined by history, clinical findings and relevant base line laboratory test results) at the time of admission; was also recorded on arrival.

Sequential organ dysfunction score (SOFA) was calculated at the time of admission and repeated at 48 hours of admission

Information regarding any Hospital acquired infections, need for mechanical ventilation (invasive/non invasive), use of ionotropic support etc throughout the stay in medical ICU was recorded at the time of discharge from the medical ICU.

The primary outcome measured is the survival status of the patient at the time of discharge from the medical ICU (death versus discharge).

The factors which are associated with the primary outcome were analyzed, based on the data accumulated.

The medical ICU physician or Intensivist was solely responsible for decisions regarding the investigations and treatment done to the patients. The study did not interfere in any way in the management of the patients included in the study, throughout the period of hospitalization.

OBSERVATION AND RESULTS

Table: 1 DEMOGRAPHIC DATA

	YES	NO
AGE	136(<75)	63(>75)
MALES	116	-
FEMALES	83	-
DIABETES MELLITUS-II	108	91
HYPERTENSION	121	78
HOSPITAL ACQUIRED INFECTIONS	30	169
HEART DISEASE	54	145
COPD	21	178
DEMENTIA	9	190
CKD	29	170
VENTILATOR	126	73

Sex and outcome

Out of male sex, 81(60.9%) alive and 35(54%)dead. Out of female sex,52 (39.1%)alive and 31 (46%) dead.Chi-square 0.360 and p-value is 1.24.No statistically significant association found with sex and increase in mortality in elderly above 60 years admitted to medical ICU.

Age and outcome

Of age <75, 97(73%) alive and 39(59%) dead. Of age >75, 36(27%) alive and 27(41%) dead. Chi-square 3.91 and p-value is 0.04.Patients age greater than 75 is associated with increase in mortality with (P value - 0.04) in elderly admitted to medical ICU.

Diabetes and outcome

Of patients with Type 2DM, 73(55%) alive and 35((53%) dead. Of patients without Type 2 DM , 60(45%) alive and 31(47%) dead. Chi-square 0.804 and p-value is 0.061..No statistically significant association found with Type 2 DM and increase in mortality in elderly above 60 years admitted to medical ICU.

Hypertension and outcome

Of patients with Hypertension, 86(65%)alive and 35((53%) dead. Of patients without Hypertension , 47(35%)alive and 31(47%) dead. Chi-square 2.504 and p-value is 0.114...No statistically significant association found with hypertension and increase in mortality in elderly above 60 years admitted to medical ICU.

Heart diseases and outcome

Of patients with Heart diseases, 35(26%) alive and 19(29%)dead. Of patients without Heart diseses , 98(74%) alive and 47(71%) dead. Chi-square 0.712 and p-value is 0.136. No statistically significant association found with heart diseases and increase in mortality in elderly above 60 years admitted to medical ICU.

COPD and outcome

Of patients with COPD, 14(11%) alive and 7(11%) dead. Of patients without COPD , 119(89%) alive and 59(89%) dead. Chi-square 0.000 and p-value is 0.986. No statistically significant association found with COPD and increase in mortality in elderly above 60 years admitted to medical ICU.

Dementia and outcome

Of patients with Dementia, 4(3%) alive and 5(8%) dead. Of patients without Dementia , 129(97%) alive and 61(92%) dead. Chi-square 2.132 and p-value is 0.144. No statistically significant association found with Dementia and increase in mortality in elderly above 60 years admitted to medical ICU.

CKD and outcome

Of patients with CKD , 20(15%) alive and 9(14%) dead. Of patients without CKD , 113(85%) alive and 57(86%) dead. Chi-square 0.070 and p-value is 0.792 . No statistically significant association found with CKD and increase in mortality in elderly above 60 years admitted to medical ICU.

Hospital acquired infection with outcome

Of patients with HAI , 19(14%) alive and 11(17%) dead. Of patients without HAI , 114(86%) alive and 55(83%) dead. Chi-square 0.195 and p-value is 0.659 . No statistically significant association found with hospital acquired infection and increase in mortality in elderly above 60 years admitted to medical ICU.

Infection on admission with outcome

Of patients with Infection on admission , 87(65%) alive and 40(61%) dead. Of patients without Infection on admission , 46(35%) alive and 26(39%) dead. Chi-square 0.442 and p-value is 0.506 .No statistically significant association found with infection on admission and increase in mortality in elderly above 60 years admitted to medical ICU.

Ionotropes with outcome

Of patients using Ionotropes , 75(56%) alive and 58(88%) dead. Of patients without using Ionotropes , 58(44%) alive and 8(12%) dead. Chi-square 19.730 and p-value is 0.000. Use of ionotropes is associated with increase in mortality (P-value: 0.000) in elderly patients above 60 years of age to medical ICU.

Ventilator with outcome

Of patients using Ventilator , 66(50%) alive and 60(91%) dead. Of patients without using Ventilator , 67(50%) alive and 6(9%) dead. Chi-square 32.370 and p-value is 0.000.Use of ventilator is associated with increase in mortality (P-value:0.000) in elderly patients above 60 years of age to medical ICU.

SOFA Score with outcome

Mean SOFA scores at the time of admission among expired and survived patients are 8.52 and 5.43 which are statistically significant with (P-value:0.000) in above 60 years of age admitted to medical ICU.

SOFA-II Score with outcome

Higher SOFA-II scores are associated with increase in mortality with mean of 10.65 in expired patients and 4.84 in alive patients of above 60 years of age admitted to medical ICU.

SAPS-II Score with outcome

Mean SAPS-II scores among expired and survived patients are 64.86 and 32.24 which are statistically significant with (P-value:0.000) in above 60 years of age admitted to medical ICU.

Length of ICU stay with outcome

No statistically significant association between length of ICU stay and mortality was found among elderly patients above 60 years of age admitted to medical ICU.

DISCUSSION

- There are multiple factors (poor functional reserve, age etc) and pre-morbid conditions that can affect the outcome in the elderly age group who are hospitalised. We tried to analyse the factors which are associated with increased mortality in elderly admitted to medical ICU
- In our study a total of 246 patients aged more than 60 years admitted to MICU were included. It was a cross sectional observational study carried out from JUNE 2017 to JULY 2018.
- We did not find any difference in mortality between men and women above 60 years admitted with medical problems to the ICU. However, we have found that increasing age is associated with increase in mortality in patients above the age of 75 years (P-value=0.004). Similar results were found in the other studies done by Fuchs.L et.al and Nasa P et.al who found that increasing age is associated with in hospital mortality(P value-0.002).
- Contrarily, Tang EY. Et.al found no statistically significant relationship between age and MICU or hospital mortality and this was corroborated by the study done by K.Sodhi et.al who also did not find any difference in mortality between patients less than or greater than 65 years of age.(P value>0.05).
- Ely EW et.al suggested that mechanical ventilator support need not be restricted in elderly based on age as they found that thelength of hospital stay(P>0.1), mortality(P value >0.2) and

number of ventilator days ,there was no difference in both the age groups(above and below 75). In our study we did not compare the elderly and younger age groups, but overall mortality was higher in the elderly patients placed on mechanical ventilation(P value=0.000). There was no statistically significant association of length of ICU stay with outcome in our study and mean length of ICU stay in expired and alive patients was (4.8 and 4.2 respectively).We have not studied the duration of mechanical ventilation and mortality. Similar results supporting our study were found in studies performed by Sodhi.et.al(P-value=0.003) and VandenNoortgate. N et.al(P value-0.00005).

In our study we did not find statistically significant association between the pre morbid medical condition and in ICU mortality in elderly patients. The patients with prior poor functional status(ADL),and cognitive impairment did not have a worse outcome compared to those without these factors (P value- >0.05).We only looked at ICU mortality and not hospital mortality/long term mortality.

- We did not use the APACHE-II scores in our study but tried a different ICU scoring system, namely, SOFA and SAPS-II scores.
- The SOFA score which is a severity of illness scoring system at the time of admission and 48 hours after admission and has an association with mortality. We found that high SOFA score at the time of admission and after 48 hours is associated with increased mortality in elderly patients(P value=0.000), Jihane et.al also found that SOFA score was the most accurate predictor of mortality in this age group.
- In our study we found that high SAPS-II score, which is also a severity of illness scoring system , was also associated with increase in mortality in elderly patients admitted to MICU(P value-0.000), however this was not supported by the findings of Jihane et.al who did not find SAPS II useful in the elderly patient.

In our study we found that need for ionotropic support was associated with increase in mortality(P value-0.000).

CONCLUSION

In our study conducted on the elderly critically ill medical patients, we found that age greater than 75 was associated with increased mortality. Use of ionotropic support, and mechanical ventilatory support was associated with increased mortality in them.Illness scoring systems like SOFA-I, SOFA-II and SAPS score were accurate in predicting outcome in these patients. Gender did not affect outcome of the older patient. The patients with pre existing illness or poor functional status and also those with infection, whether community acquired or nosocomial, did not have a higher ICU mortality.

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