General Medicine

SOFA SORE AND ITS CORRELATION WITH OUTCOME IN CRITICALLY ILL ELDERLY PATIENTS

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ABSTRACT Sequential assessment of organ dysfunction during the first few days of ICU admission is a good indicator of prognosis. This score was developed to quantify the severity of patients illness , based on the degree of organ dysfunction data on six organ failures and are scored on a scale of $0 – 24$. Elaborate scoring systems like APACHE II and III and logistic organ dysfunction system (LODS) are cumbersome. Predictive value of SOFA score for in hospital mortality was found equivalent to more complex LODS. Studies have used SOFA score as useful predictors of outcome. This study was done to evaluate the reliability of SOFA score in predicting the outcome in critically ill elderly patients. Study concluded that increasing SOFA score is associated with increased mortality. Parameters of the scoring system like poor GCS and rising serum creatinine are consistently associated with poor mortality outcomes whereas falling platelet count, PaO2/FiO2 ratio, hypotension are not reliable parameters in assessing the mortality outcomes.

KEYWORDS :

INTRODUCTION:
The Sequential Organ Failure Assessment (SOFA) score is a simple and objective score that calculates both the number and the severity of organ dysfunction. It is a six-organ dysfunction score measuring multiple organ failure daily. Each organ is graded from 0 (average)to 4 (the most abnormal).

Although SOFA was developed primarily to describe and quantify organ function, it has been demonstrated in several studies to predict mortality and morbidity of critically ill patients. Early prediction of outcome in patients admitted into ICU is very likely to aid suitable management strategies. This may improve prognosis in such patients and prevent mortality to some extent. This scoring system also guides the efficient utilization of hospital resources, especially in a resource-starved setting. This helps avoid the dumping of valuable drugs and treatment modalities in a patient, who may not survive despite all efforts. On the contrary, they can be utilized for a person who may improve well with such costly intervention.

Also, the score can be useful in clinical research tool to evaluate various therapeutic interventions in the early stage of illness Sequential assessment of organ dysfunction during the first few days of ICU admission is a good indicator of prognosis.

Elaborate scoring systems like APACHE II and III and logistic organ dysfunction system (LODS) are cumbersome. The predictive value of SOFA score for in-hospital mortality was found equivalent to more complex LODS

AIMS AND OBJECTIVES:
To study correlation between SOFA score and outcome in critically ill elderly patients.

PATENTS AND METHODS:
A prospective study entitled **"SOFA SCORE AND ITS CORRELATION WITH OUTCOME IN CRITICALLY ILL ELDERLY PATIENTS (> 60 years)"** was undertaken at KMC, Kurnool after the approval from the ethics committee. The study was carried out from August 2019 to July 2020, and 50 patients are included.

Inclusion Criteria-
Patients> 60 years of age and admitted into the intensive care unit

Exclusion Criteria-
Age < 60 years, Immunodeficient patients (HIV patients, patients on steroids)

METHOD OF COLLECTION OF DATA
Patients who were 60 years or older and admitted to ICU during 12 months study period are included in the study after obtaining written and informed consent from the patients or patients' relatives. Relevant history, clinical examination findings, comorbidities, and the etiological account will be noted.

SOFA score of every patient was calculated on admission and at 48 hours.

Death, discharge, transfer to the general ward were considered to study endpoints. If readmitted in the ICU, patients were included in the study on first admission only.

Baseline Investigations:
- CBP
- RFT
- LFT
- Chest X-Ray
- Ultrasound abdomen
- blood culture and sensitivity
- urine culture and sensitivity in relevant cases

Investigation Needed For The Study
Serum creatinine, serum bilirubin, platelet count

STATISTICAL METHODS
Continuous variables are represented as mean and standard deviation where data follows the normal distribution, otherwise as median with range. Categorical variables are defined as frequencies and percentages. The statistical significance between the groups was assessed by the Chi-Square test, Fisher exact test, and paired t-test, Mann – Whitney u test. Data were analyzed using R studio.

RESULTS
Tab.1 Comparison of pao2/fio2 among survivors and non-survivors

Variable	survivors	Non-survivors	P-value
Pao2/Fio2	321.46±144.93	288.94±148.31	0.07

Tab.2 comparison of platelet count among survivors and non-survivors

Variable	survivors	Non-survivors	P-value
Platelet count	182480±83494.89	178620±90606.77	0.45

Tab.3 comparison of bilirubin among survivors and non-survivors

Variable	survived	Non survived	P-value
Bilirubin	1.47±0.57	1.62±1.11	0.16

Tab.4 comparison of MAP among survivors and non-survivors

Variable	survived	Non survived	P-value
MAP	88.58±14.95	87.97±15.15	0.35

Tab. 5 Table showing the comparison of GCS among survivors and non-survivors

Variable	survived	Non survived	P-value
GCS	12.28±3.14	11.5±3.76	0.05

Tab.6 Table showing the comparison of creatinine among survivors and non-survivors

Variable	Survived	Non survived	P-value
Creatinine	2.05±1.6	2.3±1.82	0.02

Tab.7 table showing comparison for urine output among survivors and non-survivors

Variable	survivors	Non survived	P-value
urine output	1916±838.69	1753±931.55	0.01

**Tab.8 table showing the comparison of SOFA score among survivors and non-survivors**

Variable	survived	Non survived	P-value
SOFA score	5.8±2.74	6.9±3.95	0.01

Tab.9 summary table of variables of SOFA score

Variable	Non survivors(n=29)	survivors (n = 21)	P-value
Pao2/Fio2	288.94±148.31	321.46±144.93	0.07
Platelet Count	178620±90606.77	182480±83494.89	0.45
Bilirubin	1.62±1.11	1.47±0.57	0.16
MAP	87.97±15.15	88.58±14.95	0.35
GCS	11.5±3.76	12.28±3.14	0.05
Creatinine	2.3±1.82	2.05±1.6	0.02
Urineoutput	1753±931.55	1916±838.69	0.01
SOFA	6.9±3.95	5.8±2.74	0.01

Fig.1 Line diagram showing changes in SOFA score among survivors and non-survivors over 48 hours
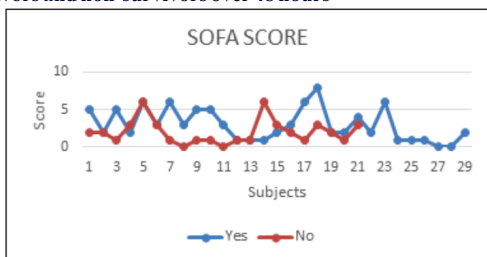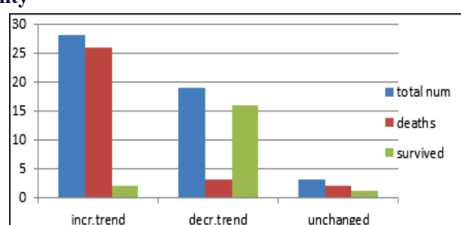

This table gives information about the percentage of deaths in patients with an increasing trend of sofa scores

Tab.10 % of deaths in patients with an increasing trend of SOFA

	Total number	Deaths	Survived	Death %
Increasing trend	28	26	2	92%
Decreasing trend	19	3	16	15%
unchanged	3	2	1	66%

Fig 2.bar diagram showing an increasing trend of SOFA and mortality

High score and relation with outcome

Tab.11 Tab showing high score and outcome

SOFA SCORE	No. Of patients	Deaths	Percentage of deaths
<5	15	0	0%
5 - 8	16	12	75%
>8	19	17	89%

CONCLUSIONS

- Measurement of SOFA score during the first 48 hours is a useful tool for predicting outcomes. SOFA score decreased in patients who survived, whereas in increased in patients who died since there is a strong correlation between a rise in score and mortality
- SOFA score between 5 – 8 is associated with mortality of 75% where a scores more than 8 are associated with mortality of 89%, indicating that high scores are associated with increased mortality which is comparable with the study conducted by Anami elza et al [Apr 2010] where the mortality with score between 6 – 7 is 50% and mortality with score > 11 is 89%.
- There is male preponderance in mortality rates observed in this study. Mortality among men was 64% and mortality among women was 36%
- Mortality rates were higher in patients with comorbidities
- GCS, Serum creatinine are the variables in the study which were found to be independent risk factors for assessing mortality
- Falling platelet count is not a very good predictor of mortality in the study
- Pao2/Fio2 ratio is not significantly associated with mortality
- In a survey conducted by Rello et al. where the SOFA score is studied in bacteremic patients, it was found that the presence of shock was the most crucial factor independently associated with the outcome, which is not a finding consistent with our study as patients of various severe illnesses which may also present with a hypertensive emergency were included in our research and this variable of high blood pressure is not a part of SOFA score.
- Early prediction of sepsis outcome using SOFA score is useful to aid suitable modification of management strategies.
- Using SOFA score can improve the overall prognosis and prevent mortality.
- Parameters like age and comorbidities will influence the outcome independent of the SOFA score parameters.

Summary

The SOFA score is a good predictor of the outcome when followed sequentially over some time. It is a more comfortable bedside scoring system than various other scoring systems. It helps define better management of financial and professional resources and monitor clinical response to therapeutic interventions. The aim of the present study is to determine the effect of SOFA score on the outcome in terms of mortality in elderly patients of age more than sixty who are not immunodeficient . The mean age of the study group is 68.82 years with 38% in the age group of 66- 70 years. There is slight male preponderance.

60% of the patients in the study had sepsis which is the major cause of admission in our study. Predominant clinical symptom with which the patients presented is fever. 34% of the patients in these study required oxygen, 30% required dialysis support, 14% required inotropic support.

The mean SOFA on admission was 5.80 and, after 48 hrs the mean SOFA was 6.90. It was found in our study that the patients who had SOFA score in increasing trend had high mortality rates than those with decreasing trend of SOFA scores. Overall mortality observed in our study was 58%.It was found that of the six variables, increasing creatinine and poor GCS are significantly correlating with outcome in terms of mortality which is consistent with various other studies.

Serum bilirubin, MAP, platelet count, Pao2/Fio2 were not significantly associated with outcome in terms of mortality.

It was found that group with score of more than 8 is associated with mortality of 89 % when compared to 75% mortality in the group with score of 5 – 8. There is 0% mortality in the group with score of less than 5.

Patients with high SOFA scores have to be taken care of in view of high mortality rates. Age and associated comorbid conditions were independent risk factors associated with mortality.

REFERENCES

1. Vincent JL, de Mendonca A, Cantraine F et al. Use of SOFA score to assess the incidence of organ dysfunction/failure in ICU : results of a multicentre prospective study , working

group on 'SEPSIS RELATED PROBLEMS' of the European society of Intensive Care Medicine. Critical care medicine 1998; 26: 1793

2.   SMS EI Said. Geriatrics intensive Care unit: outcome and risk factors for in hospital mortality
3.   Ferreira FL, Bota DP, Bross A et al serial evaluation of the SOFA score to predict outcome in critically ill patients. JAMA 2001;286: 1754
4.   Vishal et al : Journal Of Association Of Physicians Of India, vol 65, July 2017
5.   Singer M, Deutschman CS, Seymour CW et al 3rd international consensus denfinitions for sepsis & septic shock. JAMA 2016; 315: 801
6.   Qiao Q, Lu G, Li M et al prediction of outcome in critically ill elderly patients using APACHE II and SOFA scores
7.   Sodhi k, singla MK, Shrivastava A,et al. Do Intensive Care Unit treatment modalities predict mortality in geriatric patients: An observational study from an Indian ICU.
8.   Belayachi J, El khayari M, Dendane T, et al. Factors predicting mortality in elderly patients admitted to a Moroccan medical intensive care unit. South Afr J Crit Care 2012; 28: 22