



COMPARISON OF PEDIATRIC SOFA SCORE WITH ADULT SOFA SCORING SYSTEM.

Pediatrics

DrPriya Gogia Senior Resident, Department of Pediatrics, AIIMS, Bhopal (M.P.)

Dr Priyanka Shukla* Senior Resident, Department of Pediatrics, AIIMS, Bhopal (M.P.) *Corresponding Author

Dr T A Sangeeth Post graduate, Department of Pediatrics, AIIMS, Bhopal (M.P.)

ABSTRACT

Since sepsis is an important cause of mortality in ICU, many scores have been developed to ascertain the prognosis of patients in PICU. In this study, we have applied the SOFA score in pediatric population. The results of this study have been compared with a study using SOFA score in adults.

KEYWORDS

SOFA score, PELOD score, PICU, mortality.

INTRODUCTION: Sepsis is an important problem in medicine due to its complex pathophysiology and therapeutic aspects. Although this syndrome has been defined in several ways, it represents the clinical presentation of systemic response of the body to an infection or to an inflammatory disease.

In hospitalized patients, sepsis is a very common cause of Multiple organ dysfunction syndrome (MODS). MODS are considered as the last stage in the continuum SIRS- Sepsis- Severe Sepsis- MODS.

PICU is a vital component of tertiary pediatric care. It aims to provide quality care for severely sick children. These units constitute one of the main consumers of hospital budgets.

ICU is a centre where critical patients are managed. Estimation of severity of disease and probability of death are important factors to ascertain the prognosis of patients in PICU. These prognostic factors should be informed to the attendants clearly to explain the goals of treatment and to involve them in the decision making.

Any imperfection in explaining the prognosis will cause inconvenience and discomfort for the patients' family and also the doctor. Recently there has been a tendency of increasing malpractice charges towards doctors, especially with respect to deceased or disabled patients. This could be due to inadequate information given by physician on the severity of disease and the alternative therapy comprehended by family or parents. Since PICU patients usually have critical illnesses with high mortality, it is necessary to ascertain the disease severity and probability of death. An accurate prognostic assessment can lead to correct monitoring and management.

A rational technique to estimate the severity of disease is by using a probability model to predict mortality risks. Hence, a scoring system has to be developed. There are currently many scoring systems available to estimate mortality risks.

Death is considered to be most reliable endpoint for clinical trials in ICU. But with death as the primary endpoint measurement, low mortality rates in PICU (about 6% vs 20% in adult intensive care units) increases the sample size necessary to finish a trial, which decreases the practicability of performing clinical trials in these setups.

METHODOLOGY:

TITLE: Comparison of Pediatric SOFA Score With adult SOFA scoring system
PLACE OF STUDY: The study was conducted in PICU, Department of Pediatrics.

STUDY DESIGN: It was a Prospective, Observational; Hospital based study done on 100 subjects for a period of one year.

INCLUSION CRITERIA:

- Critically sick children admitted in PICU.

- Age between 1 year to 15 years.

EXCLUSION CRITERIA:

- Age <1 year and ≥15 years.
- Duration of stay <72 hrs.
- Transfer to other department, referred to higher centre or discharged on request.

CONSENT: Written and informed consent in local language was obtained prior to enrollment in study.

ETHICAL APPROVAL: Ethical approval for this study was obtained from Institutional Ethics Committee.

METHOD OF STUDY: Data was collected in a pre- designed collection sheet and includes demographic characteristics, reasons for ICU admission, SOFA scoring system and ICU outcome. The SOFA scoring system (as per proforma) consists of physical and laboratory variables representing six organ systems namely neurological, cardiovascular, renal, respiratory, hematological and hepatic system. After recruitment in the study, patients were followed until they were discharged from PICU or deceased. The SOFA score was calculated for the subjects during the first 24 hours of admission in PICU. SOFA score was repeated at 48 hours. The Delta SOFA calculated as the change in SOFA score over 72 hours. In each organ system, the highest score in any variable accounted would be taken as the score for the organ system. The sum total of the 6 scores for each organ system gives SOFA score which were used to predict risk of mortality in PICU.

MATERIALS

Automatic Hemolytic Analyser: For white blood cell and platelet counts.

Biosystem A: For estimation of creatinine and aspartate transaminase level.

Quick Method: For determination of prothrombin time.

Blood gas analyser: For estimation of PaO₂ and PaCO₂.

STATISTICAL ANALYSIS: Statistical analyses were done using SPSS software version 20. Z test was applied to determine mean SOFA score in survivors and non-survivors. Pearson's correlation coefficient was used to evaluate the correlation between Delta SOFA score and length of stay among survivors and non-survivors.

RESULTS

Comparison of SOFA SCORE at T0 and T 48 hours outcomes in pediatric and adult population

	NON SURVIVORS		SURVIVORS		TOTAL	
	PRESEN T STUDY	REFER ENCE	PRESE NT STUDY	REFE RENC E	PRESE NT STUDY	REFE RENC E

AT T0	<7	5	15	32	12	37	27
	>7	22	9	41	4	63	13
AT T 48	<7	1	16	70	15	71	31
	>7	26	8	3	1	29	9

DISCUSSION: Sepsis is the clinical manifestation of a systemic response of the body to infection or to an inflammatory-associated acute disease. There are many scoring systems to predict the prognosis of sepsis like the Glasgow, APACHE, and SOFA. Studies have been performed to compare merits and prognostic ability of SAPS II with SOFA and APACHE with SOFA. In this study, The SOFA score was calculated to assess the severity of sepsis and multi-organ failure at presentation and after 48 h and compared with a study conducted in Adult patients. In this study, initially, SOFA score at admission to ICU was calculated. In the group of patients in whom SOFA was <7 there were 86.49 % survivors. In patients with SOFA >7 there were 65.08 % survivors.

Thereafter, the SOFA score at 48 h of admission was calculated. In the group of patients having SOFA score < 7, there were 98.59% survivors and 1.41% non-survivors. In the patient group, which had scores of 8-15, there were 89.66 non survivors.

In the study by Charan et al., SOFA score at 48 h of admission was a better predictor of mortality ($P < 0.001$) than the score at admission. Both the mean and highest SOFA scores were particularly useful predictors of outcome. Hence, sequential assessment of organ dysfunction in patients of sepsis admitted to ICU is a good indicator of prognosis.

CONCLUSION-

PELOD score, which is used for prognosticating PICU outcome in children is cumbersome (complexity in understanding & time consuming) as it involves 12 criteria's and also has many of the logistics issues. In present study, we calculated SOFA score for outcome and prognosis of PICU children which is less time consuming method takes into account 6 criteria's that additionally decreases the complexity & gives results with no logistics issues. Hence SOFA score can be better method when it comes to resources and time constrains.

REFERENCES

1. Ramesh S., Development of Pediatric Intensive care units in India. Indian Journal of Anesthesia 2003; 47(5): 338-344.
2. Pollack MM, Ruttimann UE, Getson PR. Pediatric risk of mortality score (PRISM). Critical care medicine 1988; 16: 1110-1116.
3. Pollack MM, Patel KM, Ruttimann UE. PRISM III: an updated pediatric risk of mortality score. Critical care medicine 1996; 24: 743-752.
4. Pollack MM, Patel KM, Ruttimann UE. PRISM III-APS: Pediatric risk of mortality III- Acute Physiology Score. Critical care medicine 1997; 18: 916-927.
5. Beal AL, Cerra FB. Multiple organ failure syndrome in the 1990s. Systemic inflammatory response and organ dysfunction. JAMA 1994; 271: 226-33.
6. Vincent JL, Bihari D. Sepsis, severe sepsis or sepsis syndrome: Need for clarification. Intensive Care Med 1992; 18: 255-7.
7. Russell JA, Singer J, Bernard GR, Wheeler A, Fulkerson W, Hudson L, et al. Changing pattern of organ dysfunction in early human sepsis is related to mortality. Crit Care Med 2000; 28: 3405-11.
8. Minne L, Abu-Hanna A, deJonge E. Evaluation of SOFA-based models for predicting mortality in the ICU: A systematic review. Crit Care 2008; 12: R161.