Outcome of Intensive Care Unit Patients Using Pediatric Risk of Mortality (PRISM) Score

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We conducted this study to evaluate the outcome of 203 patients admitted to PICU, using PRISM score. Overall mortality was 16.7%. The mean PRISM score was 6.5 ± 3.6 and 15.5 ± 7 for survivors and non survivors, respectively (OR: 1.36; 95% CI=1.24–1.5; $P<0.001$). PRISM score also correlated well with length of hospital stay and the number of organ failures ($P<0.001$). A cut off score of 15 was associated with 89.2% accuracy. PRISM score is highly sensitive in predicting the outcome of pediatric patients in an ICU setting.

Keywords: *ICU, Mortality, Outcome, PRISM score.*

Pediatric risk of mortality (PRISM) score is considered to be the most effective in predicting the risk of mortality[1-3]. Data on the validity of PRISM outside USA and Europe is limited, especially in developing countries [1,2,4-6]. We conducted this study to evaluate the sensitivity of PRISM score in predicting the outcome of patients admitted to a PICU, in India.

METHODS

Data were collected from a 12 bedded PICU of a tertiary care hospital between March 2004 to February 2005, after the approval from Institutional review board. Informed consent was obtained from the parents. At admission, PRISM score was calculated[7] for all the patients meeting the selection criteria, after a detailed history and examination for the primary system affected and the number of organ failures. Children with congenital malformations, less than one month of age, less than one hour of hospital stay and patients discharged against medical advice in whom the outcome was not known were excluded. Blood pressure was recorded using non-invasive blood pressure monitor and oxygen saturation with a pulse oximeter. The FiO_2 required to maintain oxygen saturation above 90% was noted with oxygen monitor. Arterialized capillary heel prick blood was used for determining PaO_2, $PaCO_2$ and bicarbonate. Standard laboratory techniques were utilized to estimate total bilirubin, potassium, calcium, glucose, prothrombin time and partial thromboplastin time. The clinical assessment of heart rate, respiratory rate and pupillary reaction and the Glasgow Coma score were noted by the resident doctor. The patients were followed up during the hospital stay and the outcome measures were recorded as died or survived at the end of the hospital stay. The results were analyzed applying appropriate statistical tests.

RESULTS

A total of 203 out of 222 admissions to PICU were analyzed meeting the selection criteria. Overall, 16.7% children died. Non-survivors had significantly more number of organ failures at admission compared to survivors (1.5 ± 0.9 *vs* 0.2 ± 0.5; $P<0.001$)

WHAT THIS STUDY ADDS?

- PRISM score is sensitive in predicting the outcome of pediatric in an ICU setting.

The mean duration of hospital stay was more in survivors (6.5±3.4 *vs* 3.3±3.1 d; *P*<0.001).The proportion of the deaths was 5.3% with PRISM score of 1-9 and increased to 100% with scores of 20-29 (***Table* I**). The mean PRISM scores were lower in survivors (6.5±3.6 *vs* 15.5±7; *P*<0.001). Among the variables affecting the outcome, only the number of organ failures had a moderate correlation with PRISM score (*r*=0.586, *P*<0.001). With an increase in PRISM score by 1, the child's odds of death increased by 36% (OR 1.36, 95% CI=1.24-1.5). There was no difference between the observed and expected outcome (*P*=0.63) using the goodness of prediction model, suggesting a highly significant prediction by PRISM score. This was confirmed by the logistic model with 89.2% of patients correctly classified. This suggests prediction of the mortality by PRISM scores is valid and reliable.

DISCUSSION

In this study, PRISM score was associated with an increase in the mortality, with 89.2% accuracy with the cut off point of 15. The prediction of probalities of death using PRISM score in our study showed the probability of death increases significantly with increase in PRISM score and there was no significant difference between the observed and the predicted outcomes, suggesting PRISM score to be a sensitive predictor of outcome. This was comparable to other studies(1,2). The major limitation of this study was a small sample size. Regular use of scoring systems in PICU provides an opportunity not only to

predict the outcome but also helps in improvement of the quality of care within the limited resources available.

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TABLE I. PROBABILITY OF DEATH VS PRISM SCORE

PRISM score	Probability of death (%)
5	4%
10	16%
15	48%
20	81%
25	95%
30	99%