

Sick Neonate Score: Role in Predicting Neonatal Mortality

Jyoti Agrawal*

Department of Neonatology, BP koirala Institute of Health Sciences, Sunsari Nepal

INTRODUCTION

MSNS is a useful neonatal disease severity score specifically designed for use in district level SNCUs and such other resource-constrained settings [1]. Total score of ≤ 10 could be used to predict mortality. India contributes to 25% of the neonatal deaths worldwide, accounting for 1 million neonatal deaths each year [2]. There is a need for a reliable but simple scoring systems to assess well-being of newborns at arrival to a tertiary center after transportation over long distances. There are (different) neonatal disease severity scoring systems already in existence [3].

Desirable properties of such scoring systems have been described as ease of use, applicability early in course of hospitalization, ability to reliably predict mortality and specific morbidities and ability to discriminate between infants with different outcomes [4]. However not all scoring systems fulfill these criteria. Sickness severity scores have widely used in neonatal intensive care. Principally this has been to adjust the mortality observed in a particular hospital or population for the morbidity of their infants, and hence allow standardised comparisons to be performed [5].

On the other hand, although risk correction has become relatively commonplace in relation to audit and research involving groups of infants, the use of such scores in giving prognostic information to parents, about their baby, has been much more limited [6]. The strengths and weaknesses of the existing methods of disease severity correction in the newborn are presented in this review [7].

BACKGROUND AND OBJECTIVES

The neonatal period correspond to the most vulnerable time for a child's survival. Various illness severity scoring have been used as predictors of neonatal mortality but none of those can be used in resource limited settings. The objectives were to assess the validity of sick neonate score as predictor of neonatal mortality.

METHODS

A descriptive prospective study was conducted on 320 newborns admitted at NICU of BPKIHS during study period of one year.

The SNS score was applied at admission and babies were followed up for outcomes.

RESULTS

All extramural ill newborns transported to the neonatology unit of a tertiary care hospital over a period of one year. Correlation between SNS, SNAPPE-II and SNS scoring, and sensitivity/specificity of each score to predict mortality were determined. Neonatal mortality of 18% was observed. Prematurity and birth asphyxia were major cause. The difference in mean SNS score of survived and expired newborns was statistically significant (11.35 vs 8.02) [8].

Area under ROC curve came out to be 0.88. The best combination of sensitivity, specificity, positive predictive value and negative predictive at cut-off value of 9 was 82.75%, 86.49%, 60% and 90% respectively [9]. On comparing SNS parameter with outcome by univariate analysis, all parameter were significant in predicting mortality [10]. Low Spo2 found in 96% of expired babies. Out of those neonates who had prolonged CRT at admission (n=91), 43(47%) of them expired. The odds of neonatal mortality with prolonged capillary refill time was 4.2 [11].

CONCLUSION

Lower the SNS score poorer the neonatal outcomes. SNS can be used as a good tool to know prognosis, assesses newborn at admission, appropriate level of care and counseling can be done even at resource limited centres. Illness severity scores are now well accepted as essential tools when comparing healthcare providers. When using an illness severity score, it is important to remain clear about the question being investigated to be sure that the scoring system being used is appropriate. The use of an existing score, developed for another purpose, simply because it is convenient is unlikely to represent the best approach.

It is also important to remember that, even the best scoring systems are not completely accurate. No mathematical formula can completely capture the complex clinical processes in a neonate. The use of scores for predicting individual outcomes is fraught with difficulty, most particularly because of variation in the approach to clinical care adopted by different units (and

Correspondence to: Sunsari Nepal, Department of Neonatology, BP koirala Institute of Health Sciences, Sunsari Nepal; E-mail: ymaguchi@hs.med.kyotou.ac.jp

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even clinicians in the same unit) as well as important ethical and legal concerns. It is almost certainly these issues that have, rightly, limited the extent to which scoring systems have been used for individual risk prediction and counselling.

REFERENCES

1. Lawn JE, Cousens S, Zupan J. 4 million neonatal deaths: When? Where? Why? *Lancet*. 2005;365:891-900.
2. Dorling JS, Field DJ, Manktelow B. Neonatal disease severity scoring systems. *Arch Dis Child Fetal Neonatal Ed*. 2005;90(1):11-16.
3. Richardson DK, Corcoran JD, Escobar GJ, Lee SK. SNAP-II and SNAPPE-II: simplified newborn illness severity and mortality risk scores. *J Pediatr*. 2001;138(1):92-100.
4. Rathod D, Adhisivam B, Bhat BV. Sick neonate score – a simple clinical score for predicting mortality of sick neonates in resource restricted settings. *Indian J Pediatr*. 2016;83(2):103-106.
5. Samanta M, Mondal R, Ray S, Sabui T, Hazra A, Kundu C, et al. Normative blood pressure data for Indian neonates. *Indian Pediatr*. 2015;52(8):669-673.
6. Lee SK, Aziz K, Dunn M, Clarke M, Kovacs L, Ojah C, et al. Canadian Neonatal Network Transport Risk Index of Physiologic Stability, version II (TRIPS-II): A simple and practical neonatal illness severity score. *Am J Perinatol*. 2013;30(5):395-400.
7. Broughton SJ, Berry A, Jacobe S, Cheeseman P, Tarnow-Mordi WO, Greenough A for Neonatal Intensive Care Study Group. The mortality index for neonatal transportation score: A new mortality prediction model for retrieved neonates. *Pediatrics*. 2004;114(4):e424-428.
8. Signorini DF, Weir NU. Any variability in outcome comparisons adjusted for case mix must be accounted for. *BMJ*1999;318:128.
9. Fleisher BE, Murthy L, Lee S. Neonatal severity of illness scoring systems: a comparison. *Clin Pediatr*1997;36(4):223–227.
10. Rosenthal GE, Harper DL. Cleveland health quality choice: a model for collaborative community-based outcome assessment. *Jt Comm J Qual Improv*1994;20(8):425–442.
11. Mathur NB, Arora D. Role of TOPS (a simplified assessment of neonatal acute physiology) in predicting mortality in transported neonates. *Acta Paediatr*. 2007;96:172-175.