

The Pulse Oximeter Perfusion Index as a Predictor for High Illness Severity in Neonates

De Felice C, Latini G, Vacca P, Kopotic RJ. *European Journal of Pediatrics* 2002; 161:561-562.

Introduction

The perfusion index (PI) of a pulse oximeter is the pulsatile signal indexed against the non-pulsatile signal, expressed as a percentage (AC/DC X 100). Since this potential measure of peripheral perfusion does not require direct caregiver observation, which can be compromised by factors such as unpredictable skin coloration, its value as an assessment tool could be high. These researchers studied whether the perfusion index of the Masimo SET Radical could be used to assess the severity of neonatal illness.

Methods

Illness severity of 101 Caucasian infants was judged according to the Score for Neonatal Acute Physiology (SNAP) and each infant was placed into either the High Illness or Low Illness category. An operator who was unaware of the infant illness severity group captured PI values generated by a Masimo SET oximeter at regular intervals. SpO₂, pulse rate, body temperature, and blood pressure were also measured.

According to the predefined criteria, 43 neonates were admitted to the high severity group and 58 to the low severity group. The high severity group showed significantly higher severe neonatal morbidity. The receiver operating characteristic (ROC) curve was used to calculate the accuracy of the PI, SpO₂, and pulse rate in predicting high illness severity.

Results

SpO₂ and pulse rate showed insufficient accuracy in predicting illness severity, while the PI's predictive accuracy was shown to be significant, with 95.5% sensitivity, 93.7% specificity, 91.2% positive predictive value, and 96.8% negative predictive value.

	High Severity (43 neonates)	Low Severity (58 neonates)
PI*	0.86 ± 0.26	2.02 ± 0.70
SpO ₂ *	93.3 ± 5.4%	95.1 ± 3.9%
Pulse Rate*	139 ± 16 bpm	133 ± 17 bpm

*p<0.0001

Authors' Conclusion

"The results of the present study indicate that PI provides an unambiguous value, is not affected by the factors typically associated with subjective interpretation, and can provide easy, noninvasive and unattended monitoring of illness severity in neonates."