

First Day of Life Reference Values for Pleth Variability Index in Spontaneously Breathing Term Newborns.

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Background

The perfusion index (PI), derived from the pulse oximetry signal, has been shown to be an accurate predictor for identifying high illness severity in neonates. The plethysmographic variability index (PVI) is a measure of the dynamic change in PI occurring during a complete respiratory cycle.

Objectives

The aim of this study was to establish the reference range of PVI in spontaneously breathing term newborns.

Methods

PI and PVI values were assessed in 242 term newborns during the first day of life.

Results

The median PVI value on the first day of life was 20% [95% confidence interval (CI) for the mean 19–20%; inter-quartile range 15 (95% CI 15–16) – 24 (95% CI 23–24)]. The 10th and 90th percentile cutoff values were 12% (95% CI 11–12) and 28% (95% CI 27–29), respectively, with the 97.5th percentile of 35% (95% CI 34–38). PVI was also significantly influenced by the behavioral status of the newborn, and was positively correlated with PI and pulse rate, while it was inversely correlated with oxygen saturation ($p < 0.0001$).

Conclusions

Our findings suggest: (1) evaluation of PVI values is an easily applicable, noninvasive procedure for monitoring early post-natal respiratory changes in newborns, and (2) the feasibility of a noninvasive pulse-oximeter postnatal screening for early identification of adverse neonatal cardiorespiratory outcomes.