

Changes in Perfusion Index Are Not Reflected in Pulse Oximetry Saturation and Heart Rate.

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Background

Perfusion index (PI) is measured by calculating the ratio of pulsatile to non-pulsatile infrared signal transduced at the pulse oximeter monitoring site. Clinically, PI has been found to correspond to the relationship of pulsatile to non-pulsatile blood at the measurement site. Parameters of clinical well-being in the neonate (e.g., SNAP-I and NTISS) have been found to correlate well with values of PI. For this study, we sought to determine whether PI is independent of Heart Rate and Pulse Oximetry Saturation.

Methods

Segmental samplings of 6 hour intervals were obtained from 140 hours of monitoring using the Masimo Radical (V4.1) with signal extraction technology. Saturation, Pulse Oximetry Heart Rate, and PI were analyzed according to autoregressive Integrated Moving Average (ARIMA) and Bivariate Spectral analysis. Transforms of PI were mapped for concordance with Saturation and Heart Rate.

Results

No strong periodicity in the series at the respective peak frequency was identified. Cross periodogram, cospectral density, and cross amplitude measures failed to identify similarities in the resultant waveforms. Polynomial regressions of the resultant plots were likewise dissimilar as noted in the graph below.