

Agreement of desaturation indices between Masimo SET and Nonin oximetry technology.

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Introduction and Aims

The validity of pulse oximetry (PO) acquired by Masimo SET oximetry (Masimo, UK), which utilises 2 second averaging time, is well established. The Somnomedics Somnoscreen device (S-Med, Birmingham, UK) used for inpatient cardiorespiratory polygraphy (CP) studies incorporates the Nonin (Minnesota, USA) oximeter, which utilises pulse-by-pulse filtering with higher frequency sampling times. This study aims to compare 3 % oxygen desaturation indices (ODIs) for the 2 oximeters.

Methods:

Data were collected from all inpatient CP studies that had concurrent Masimo PO recordings between December 2014 and March 2015. Wake periods were removed from the CP studies based on behaviour observed on the video recording and periods of gross body movement. Artefact and periods of 'Wake', based on half hourly patient observations were manually removed from the Masimo PO studies. Descriptive statistics, Student's t-test, Spearman's correlation, and Limits of Agreement (LOA) were calculated in SPSS 22 for SpO₂ and ODIs.

Results:

CP and PO studies were available for 66 children (37 females), median age 4.0 years (6 months – 16 years). 3% ODIs reported in the Nonin PO were significantly higher than the Masimo PO (Table 1), but the two measurement were highly correlated ($r=0.724$). Mean differences (and 95% LOA) were -2.98 (-13.01 to 7.05 events per hour) (Figure 1).

Conclusion

The Nonin oximeter consistently reports higher ODI when compared to the Masimo oximeter. These differences most likely reflect different intended purposes for these machines. Multichannel recording allows analysis of the aetiology of individual desaturations. The lack of reference ranges for 3% ODI makes interpretation of the significance of 3% desaturations in the absence of respiratory events difficult.

Table 1: Group results for 3% ODI

	Mean	Median	SD	Range	p	r
Masimo	8.28	3.85	13.95	0.15-76.67	0.000*	0.724
Nonin	11.26	5.80	16.25	0.20-98.20		

*Significant at the level of <0.01

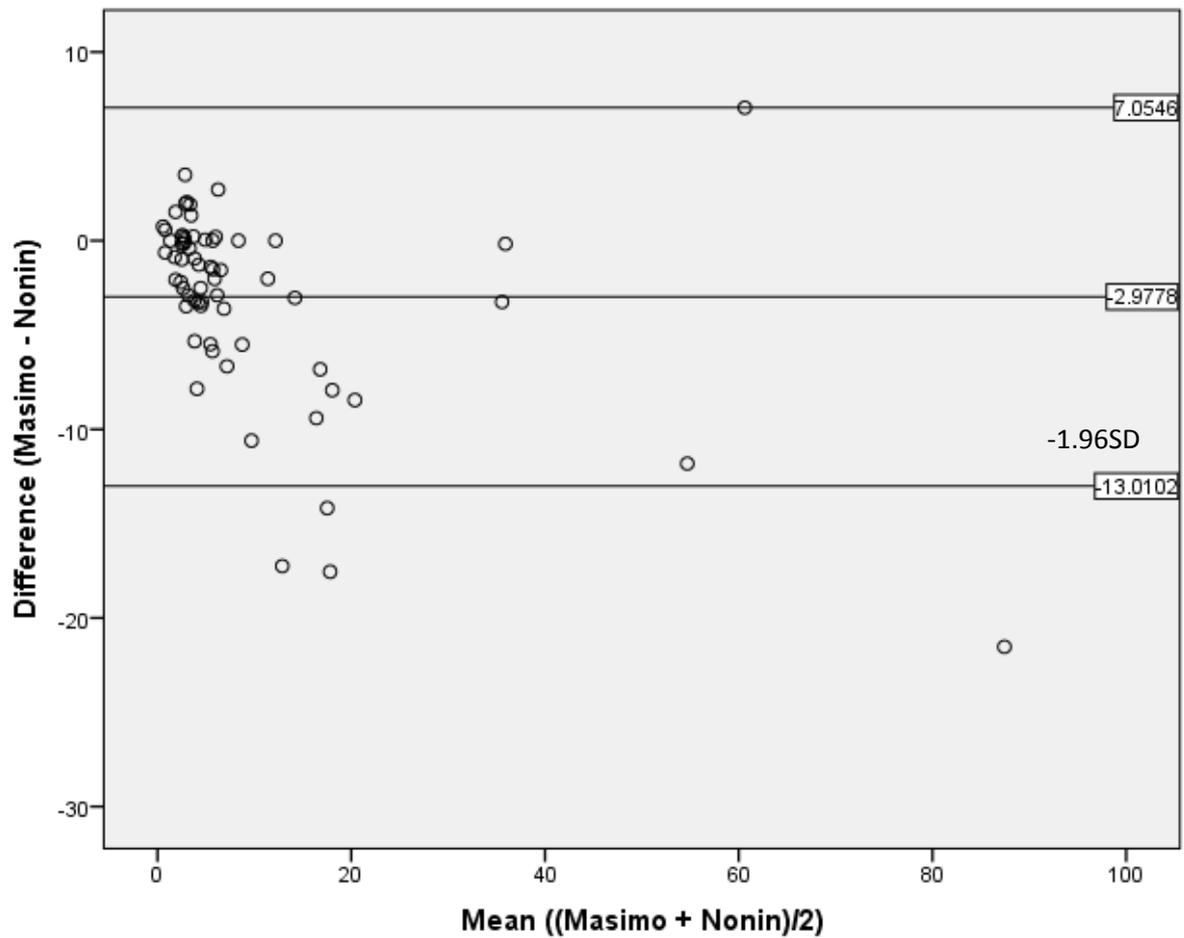


Figure 1: Bland-Altman plot of mean differences between Masimo and Nonin oximeters