

Masimo Signal Extraction Technology (SET) Does Not Offer An Advantage During Neonatal Transport.

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Introduction

Neonatal transport presents challenges for physiological monitoring. Vibration and acceleration can cause motion artefact. Signal loss or inaccuracy could lead to unnecessary interventions or delay in diagnosis. Masimo signal extraction technology (SET) is a new type of oxygen saturation monitoring that has been shown to reduce data inaccuracies due to motion artefact in some environments. *Aim:* To compare the reliability of monitoring using Masimo SET versus a standard saturation monitor (Nellcor) during neonatal transport.

Method

All infants transported by the South East Scotland Neonatal Transport Service who required monitoring were eligible for inclusion. A saturation probe from each monitor was attached to opposite feet. Data from both monitors and ECG heart rate were downloaded onto laptop during transport. ECG artefact was removed. Saturation monitor artefact was then defined to be present whenever the saturation derived HR differed from the ECG HR by more than 10 bpm. The proportion of time that each saturation monitor was affected by artefact was compared by paired T-test. HR from each saturation monitor was compared with ECG HR and precision and bias were calculated. Preliminary studies indicated that 20 transports would give 85% power to detect a 10% difference in artefact between the monitors.

Results

23 studies were carried out on 20 infants. Mean gestation was 35.5 weeks. Mean weight was 2115g. 8 transports were urgent, 15 were non-urgent. Saturation artefact proportions for the Masimo SET and Nellcor monitors were 1.13% and 1.54% ($p=0.714$). Mean oxygen saturations were 91.0% and 91.1% ($p=0.873$). The mean HR bias for the Masimo and Nellcor monitors were -0.1177 and -0.4357 BPM ($p=0.011$) and the mean precisions were 3.099 and 2.334 BPM ($p>0.001$).

Conclusions

Data loss due to artefact was a relatively uncommon phenomenon during neonatal transport with either monitor. Masimo SET monitoring offered no clear advantage.