[1534.581] Comparison of NIRS Traditional Vs Stool Compensating Somatic Algorithms When Measuring Abdominal Tissue Oxygen Saturation on Neonates ≤ 4kg

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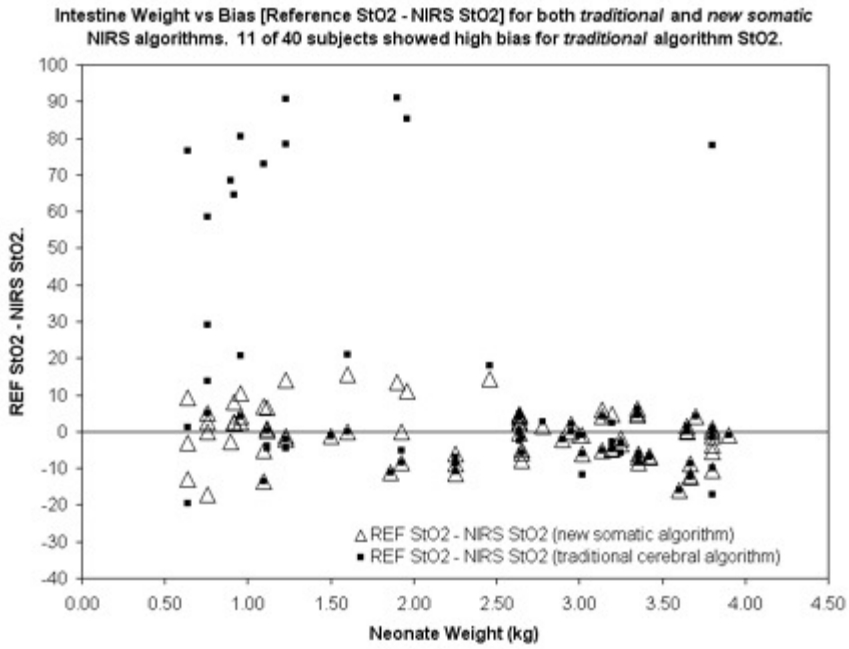
BACKGROUND: Near-infrared spectroscopy (NIRS) has been used to measure cerebral and somatic tissue oxygen saturation (StO_2), however, traditional NIRS algorithms have been primarily designed in the measurement of cerebral StO_2.
OBJECTIVE: In this study, we compared a novel stool compensating somatic NIRS algorithm vs a traditional NIRS algorithm to measure abdominal StO_2 in neonates ≤ 4 kg, using weighted umbilical venous and arterial oxygen saturation as a reference.
DESIGN/METHODS: With parental agreement we enrolled neonates with an umbilical venous catheter (UVC) in this prospective study using a NIRS oximeter (FORE-SIGHT®, CAS Medical Systems, Branford, CT USA). NIRS StO_2 values from both algorithms were compared with co-oximetry measured oxygen saturation obtained from UVC ($SuvO_2$) and pulse oximetry (SaO_2) to determine a Reference StO_2 value from the equation ($0.7*SuvO_2 + 0.3*SaO_2$). A sensor was placed over left & right flank, liver, and intestine in three positions (infraumbilical, RLQ, LLQ) for a period of 2 minutes each.
RESULTS: Data was obtained from 40 subjects weighing 0.64-3.9 kg, 1-13 days old, and GA of 24-40 weeks. Figure 1 illustrates the difference between the Reference StO_2 and NIRS StO_2 measured over the intestine as a function of subject weight. The *new somatic* algorithm StO_2 correlated more closely with the Reference StO_2, as compared with the *traditional* algorithm StO_2, which showed a high bias for 11/40 subjects, indicating stool interference. Additionally, smaller subjects (lower BW & GA) tended to have lower *traditional* algorithm StO_2 values when compared to Reference StO_2. Among organ systems, the intestine had the highest degree of stool interference, followed by the liver, and least interference in the flank measurements.



CONCLUSIONS: Data from this study suggest that the FORE-SIGHT new somatic algorithm, which compensates for the optical properties of stool, can be applied to abdominal tissue in order to yield accurate measures of abdominal StO_2.

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