

**[745] Cerebral Oximetry Using Near Infrared Spectroscopy (NIRS) in Newborns with Hypoxic Ischemic Encephalopathy (HIE) Who Qualify for Clinical Whole Body Hypothermia (WBH)**

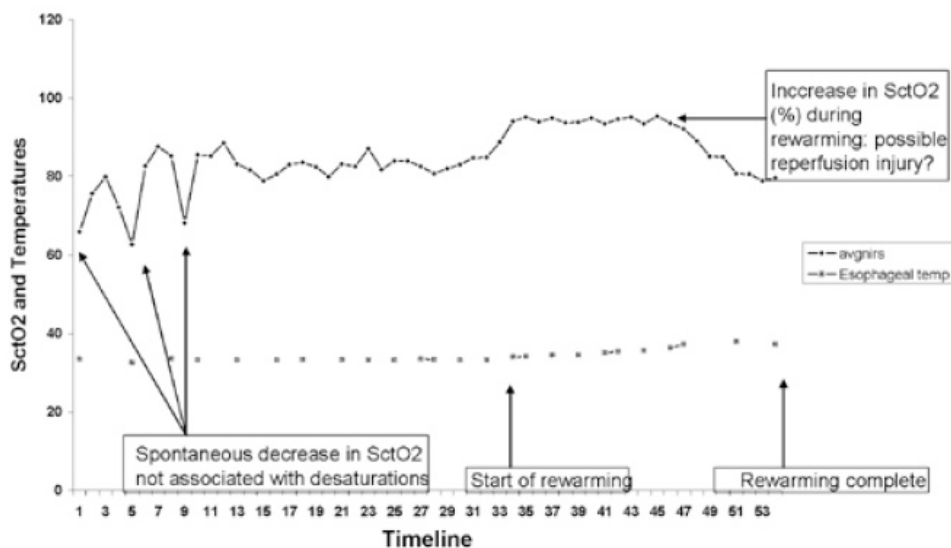
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**BACKGROUND:** Near-infrared spectroscopy (NIRS) was developed to provide a non-invasive method of measuring regional oxygen saturation. Previous studies have established that NIRS can be used to monitor oxygen content of brain in presence of HIE.

**OBJECTIVE:** To evaluate changes in absolute cerebral tissue oxygen saturation ( $\text{SctO}_2\%$ ) in newborns with HIE who undergo WBH.

**DESIGN/METHODS:** FDA approved FORE-SIGHT (Casmed) device was used in two normal newborns, four newborns with moderate HIE and two newborns with severe HIE.  $\text{SctO}_2$  levels were analyzed in the presence and absence of HIE and during phases of cooling and rewarming and across severity of HIE.

**RESULTS:** Significantly higher ( $p < 0.001$ )  $\text{SctO}_2$  levels were found in newborns with severe HIE ( $84 \pm 8$ ,  $\text{SctO}_2\%$ , Mean  $\pm$  SD) as compared to newborns with moderate HIE ( $74 \pm 5$ ) and normal newborns ( $79 \pm 3$ ). During the phase of rewarming  $\text{SctO}_2$  levels ( $90 \pm 6$ ) were significantly higher ( $p < 0.001$ ) as compared to the levels during hypothermia ( $81 \pm 6$ ) in newborns with severe HIE. In newborns with moderate HIE, the levels during cooling ( $74 \pm 4$ ) and rewarming ( $74 \pm 6$ ) were not statistically different ( $p = 0.9$ ). In newborn with severe HIE, several episodes of very low  $\text{SctO}_2$  levels not associated with decreased oxygen saturation were noted during the phase of therapeutic hypothermia. These acute decreases in saturation were not seen in newborns with moderate HIE.

**Severe HIE and  $\text{SctO}_2$** 

**CONCLUSIONS:** Baseline high Cerebral  $\text{SctO}_2$  values may reflect decreased oxygen utilization and severe brain injury. Higher  $\text{SctO}_2$  levels during rewarming phase of therapeutic hypothermia may reflect reperfusion injury. Use of NIRS technology and  $\text{SctO}_2$  levels may help monitor effects of therapeutic hypothermia on cerebral circulation. More studies are warranted to further evaluate impact of  $\text{SctO}_2$  levels on neurodevelopmental outcome in newborns who undergo WBH for moderate to severe HIE.

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