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PILOT STUDY OF FORE-SIGHT CEREBRAL OXIMETER IN CARDIAC PATIENTS

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Introduction:

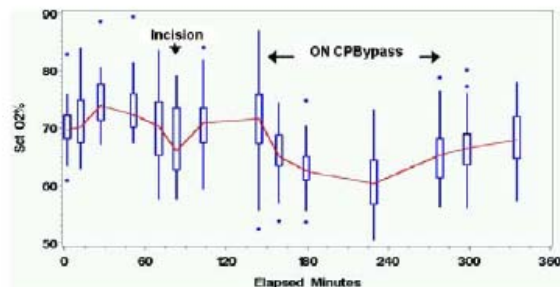
Cerebral oximetry is a non-invasive, optically-based technique to monitor brain oxygenation continuously by determining cerebral tissue oxygen saturation (SctO₂). The CAS Medical FORE-SIGHT™ Absolute Cerebral Oximeter has been validated in a recent study of awake human volunteers during controlled oxygen desaturation (SpO₂ 70-100%) and showed a strong correlation between oximeter and calculated cerebral tissue oxygen saturation [ref]. This observational pilot study was designed to determine the range of SctO₂ during stages of cardiac surgery.

Methods:

With written consent, patients undergoing CABG and/or valvular surgery (VS) with CPB were enrolled. Two FORE-SIGHT Cerebral Oximeter Sensors (left/right) were placed on the patient's forehead prior to induction. SctO₂ were recorded at 2-sec intervals; the 1-minute median value (derived from the 30 measures per minute) was calculated for both sensor readings. The average of left & right cerebral tissue oxygen saturations was used for analysis. At 14 pre-determined events the 5-minute median SctO₂ was reported. The length of time SctO₂ below 55, 60 and 65% was calculated and tested for association with gender, race, diabetes and procedure type.

Results:

33 patients (median age 68, years of education 13, gender 23M/10F, 29 W/4 AA, 8 diabetics, 27 CABG & 6 VS ± CABG [median cross-clamp time 73 v 123 mins, CPB time 112 v 178 mins]. The mean, IQR and range of 5-minute median SctO₂ for the Median Left/Right Average SctO₂ at the standardized event times are shown in figure



The median durations of time below 55/60/65% thresholds were 0/21/105 mins [CABG] and 88/131/191 mins [VS ± CABG]. Five of 8 VS patients (63%) had >5 minutes below 55% SctO₂, compared to just 3/25 (12%) CABG-only patients (p=0.01).

Discussion:

In this study, the median SctO₂ value of awake patients was 70%. Awake SctO₂ variability was small (SD 3.9%) independent of age, skin color and gender. The pre-CPB median SctO₂ 72% dropped to 60% during CPB before returning to 68% at chest closure. VS patients showed longer periods below all 3 thresholds of SctO₂ values. This group did have significantly longer cross-clamp and CPB times; this may have contributed to greater times below the thresholds. Further study is ongoing to evaluate the significance of this observation with regard to clinical outcome.

Reference:

Anesthesia Analgesia 2006; 102(25):S162