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Cerebral Oximetry Readings In The Sitting Position Versus Supine Position For Patients Undergoing General Anesthesia

Abstract
Problem: Inadequate cerebral blood flow is a significant risk for patients undergoing surgery in the sitting position. Placing the patient in a sitting position may cause a drop in pressure at the level of the brain when compounded with induction and maintenance of general anesthesia. These changes may cause a decrease in cerebral blood flow and oxygenation. Inadequate perfusion for a prolonged period of time could produce negative neurological consequences in the short and long term postoperative period.

Purpose: The purpose of this project is to determine if there is a significant drop in cerebral oximetry, from baseline, when patients are placed in the sitting position for surgery, while under general anesthesia.

Methodology: Data were collected on 50 patients who underwent surgery in the sitting position. The following information was gathered retrospectively for each subject studied: Left and right hemisphere cerebral oximetry readings, age, gender, ASA score, temperature, end-tidal carbon dioxide (ETCO₂), blood pressure, and fraction of inspired oxygen (FiO₂). A repeated measures analysis of variance (ANOVA) was used for statistical analysis.

Results: A decrease in LCOR readings was noted between initial (M=71.46, SD=5.97) and 15 minute post sitting position (M=68.96, SD=6.55), a statistically significant mean decrease of 2.5, 95% CI [0.95, 4.05], p=0.001. There was also a decrease in LCOR readings between initial (M=71.46, SD=5.97) and 30 minute post sitting position (M=68.86, SD=6.85), a statistically significant mean decrease of 2.6, 95% CI [0.84, 4.36], p=0.002. A decrease in RCOR readings was noted between initial (M=71.92, SD=5.88) and 15 minute post sitting position (M=69.12, SD=6.83), a statistically significant mean decrease of 2.8, 95% CI [1.01, 4.59], p=0.001. There was also a decrease in RCOR readings between initial (M=71.92, SD=5.88) and 30 minute post sitting position (M=68.36, SD=7.54), a statistically significant mean decrease of 2.56, 95% CI [0.37, 4.75], p=0.017.

Conclusion: Statistically significant differences were determined between initial cerebral oximetry readings and 15 minute post sitting position readings, as well as between initial readings and 30 minute post sitting position readings. This difference was noted for both left and right hemispheres.