**A1532** ASA 2010
Wednesday, October 20, 2010; 8:00 AM - 9:30 AM Room Mezzanine 14B

# The Effect of Anesthetic Technique on Cerebral Oxygenation in the Beach Chair Position

Menachem M. Weiner, M.D., Gregory W. Fischer, M.D., Toni M. Torillo, M.D., Hung-Mo Lin, Ph.D., Meg A. Rosenblatt, M.D.
Department of Anesthesiology, Mount Sinai School of Medicine, New York, New York

**Background:** Ischemic brain injury has been reported in patients undergoing shoulder procedures in the beach chair position. This position is frequently used because it provides optimal surgical exposure, however it causes significant hemodynamic derangements, the responses to which are compromised by anesthetics. Cerebral oximetry is a technology, validated by numerous abstracts and papers, that measures cerebral oxygenation (SctO2) using near infrared spectroscopy. We hypothesized that monitoring SctO2 in the sitting position would provide an additional protection against cerebral ischemia. We investigated the relationship between SctO2, mode of ventilation (mechanical versus spontaneous), mean arterial pressure (MAP), end-tidal CO2 (etCO2), and vasopressor requirements.

**Methods:** Cerebral oximetry (FORE-SIGHT®, CASMED, Branford, CT) was used to monitor 82 patients undergoing elective surgery of the shoulder in the beach chair position. Patients received either propofol sedation or inhalation agent through an LMA and were considered the spontaneously ventilating (SV) group while the other group was comprised of patients who had mechanical ventilation (MV) with endotracheal intubation. The cerebral oximeter readings were recorded every 15 seconds. A SctO2 decrease to an absolute value of less than 50% or the MAP corresponding to the Circle of Willis was less than 50 mmHg, would trigger the administration of a vasoactive agent. Time spent beneath different SctO2 thresholds and time series data for etCO2, MAP, and SctO2 were analyzed.

**Results:** The SV group consisted of 44 patients who had an interscalene block (ISB) and propofol sedation and 30 patients who had an ISB and sevoflurane through an LMA. The MV group consisted of 7 patients with an ISB and isoflurane administered through an endotracheal tube (ETT) and 1 had isoflurane with an ETT only.

Cross correlation revealed that changes in MAP and/or etCO2 predict changes in SctO2 in MV patients, but this relationship only exists between etCO2 and SctO2 but not MAP in SV patients. The trend of the correlation for the MV group suggests that changes in ETCO2 lead to rapid changes in SctO2, the changes do not last for a prolonged time, and the correlation quickly drops.[figure1][figure2]Conclusion: MV patients were more prone to have decreases in their threshold SctO2 values than SV patients. This is likely secondary to a loss of cerebral autoregulation in the hyperventilated brain, and cerebral oximetry may be beneficial in guiding interventions to avert ischemic events. SV patients demonstrate preserved cerebral autoregulation and do not benefit from the use of cerebral oximetry in the sitting position.

**From Proceedings of the 2010 Annual Meeting of the American Society Anesthesiologists**