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Preventive interventions for rising intraocular pressure: Validation & development of an observation scale (MBOS)

Bonnie Molloy
Yale New Haven Health Systems, USA

Following a case of postoperative visual loss (POVL) in the steep Trendelenburg (ST) position at our institution, IOP measurements were taken during laparoscopic surgery. IOP was observed to rise over time with increases (4-5 times baseline). While monitoring we observed eyelid edema, conjunctival edema (chemosis), ecchymosis, and facial edema and hypothesized that findings were correlated to rising IOP. We trialed a preventive supine intervention that significantly impacted increase in IOP and may potentially prevent future (POVL) events since current literature cites retinal cell ganglion dysfunction as a result of even brief acute increases in IOP. Additionally, increased peri-orbital swelling and venous congestion secondary to trabecular meshwork dysregulated pressure dependent outflow may produce a low perfusion state in the eye, via a compartment syndrome mechanism. Cosopt TM (Timolol/ Dorzolamide) eye drops were trialed since this drug has dual action as a carbonic anhydrase inhibitor and a beta adrenergic blocker. Prevention of IOP rising above 40 mmHg was the goal in these studies since 45 -55 mmHg IOP was determined to be a critical threshold in POVL incidents. The aim was to provide an observation scale that enables the anesthesia caregiver to gage timing of intervention so as to prevent increases in IOP. Cosopt trial analysis showed statistical significance in comparison to ST group. Findings of eyelid edema correlated to a 2.5 times increase in baseline IOP. Findings of chemosis correlated to a 3.4 times increase. An additional study site was used to generalize and validate initial findings and to increase sample size.

Methods: The study design was a prospective repeated measure regression model. Patients undergoing ST position surgery were enrolled in 2 hospitals in CT. Patients' IOP and presence of eyelid edema and chemosis measured by MBOS were recorded at the start of surgery and at 30, 60, 90, and 120 minutes throughout the surgery. Multivariate logistic regression analysis using the generalized estimating equations (GEE) method was employed. A receiver operating characteristics curve (ROC) was used to determine the accuracy of the MBOS in diagnosis of IOP at the cut point of 40 mmHg.

Biography

Bonnie Molloy has been studying postoperative visual loss (POVL) and conducting research in this field since 2005. She completed her doctoral dissertation in 2010 in the Development of The Molloy / Bridgeport Anesthesia Associates Observation Scale (MBOS). She presently is the Chief CRNA in the Bridgeport Anesthesia Associates practice at Bridgeport Hospital and as a Yale healthcare affiliate has conducted research at Yale New Haven and the Hospital of St. Raphael. She is the Research Director of the Anesthesia Department at Bridgeport Hospital as well as a clinical and didactic faculty member for the Fairfield University Doctor of Nursing Practice Program.

bonniemolloy@aol.com

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