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Preventive interventions for rising intraocular pressure: Development of an observation scale

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Abstract

Following a case of postoperative visual loss (POVL) in the steep trendelenburg (ST) position at our institution, IOP measurements were taken during laparoscopicW surgery. IOP was observed to rise over time with increases (4-5 times baseline). While monitoring we observed eyelid edema, corneal edema, 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 eye drops were trialed since this drug has a dual role 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 -55mmHg IOP was determined to be a critical threshold in POVL incidents. The aim is to provide an observation scale that enables the anesthesia caregiver to gage timing of intervention so as to prevent increases in IOP.

Methods: The study is an instrumentation development design comparing the Molloy/BAA observation scale with the gold standard of IOP measurement, tonometry. An anesthesia team was credentialed in use of a validated instrument for IOP measurement- Reichert Tonopen^{xl} tonometer. Following informed consent patients undergoing ST position procedures were enrolled. IOP was measured at start, 30 minute intervals and end of surgery. Observations were noted at each time frame. Via multiple regression analysis a correlation of observations were analyzed and assessed to be significantly predictive of rising IOP levels.

Results: Analysis showed statistically significant decrease in mean IOP of supine intervention group in comparison to ST group with P<.001. 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 corneal edema (chemosis) correlated to a 3.4 times increase.

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.