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A comparative assessment of intraocular pressure in prolonged steep trendelenburg position vs. dorozolamide/timolol ophthalmic solution (Cosopt™) [DT] intervention

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Abstract

Background: The purpose was to evaluate an intervention during laparoscopic surgery in steep Trendelenburg position (Lap ST). Increased intraocular pressure (IOP) and decreases in ocular perfusion pressure have been monitored during Lap ST procedures. Peri-orbital swelling and venous congestion in addition to IOP may produce a low perfusion state in the eye, via a compartment syndrome mechanism potentially exacerbated by trabecular meshwork dysregulated pressure dependent outflow. Research in rodent models has confirmed that in the ST position IOP can increase to critical thresholds of > 40 mmHg and studies have determined that even brief 30-40 minute episodes of acute IOP elevations can result in retinal cell ganglion (RCG) dysfunction. Dorozolamide/Timolol ophthalmic solution (Cosopt™) eye drops have been administered at 30 minute time points when IOP has approached 40 mmHg and were hypothesized to normalize IOP.

Methods: A quasi-experimental study design was used. The fixed-drug combination dorozolamide/timolol ophthalmic solution (Cosopt™) [DT} was administered topically to both eyes at any time point when IOP approached or exceeded 40 mmHg. We followed each subject's IOP at 30 minute intervals in comparison with a supine, anesthetized baseline and final post-procedure supine measurements.

Results: A total of 119 patients, 74 (62%) males and 44 females (38%) were recruited in the study. Mean age was 57±10 years old. 46 patients received cosopt treatment during the surgery at 60 min (n=13), 90 min (n=19), 120 min (13), and 150 min (n=1) when their IOP levels reached 35 - 40 mmHg. Descriptive analyses showed that IOP values in patient with cosopt treatment decreased after the treatment and were within the safe threshold during the rest of the surgery. Repeated measures of ANOVA showed that IOP values dropped significantly after given cosopt intervention at different time points, $p < 0.05$ to .01 respectively. Effect sizes of cosopt intervention on IOP were strong, partial Eta squared of 0.68, 0.72, and 0.85 when cosopt given at 60, 90, and 120 minutes during the surgery. There were no significant differences in IOP baseline and final data. (See the means of IOP in attached table and figure).

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.