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Title: Visual Disturbances Associated With Transurethral Resection of the Prostate

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Introduction. A problem associated with transurethral resection of the prostate gland (TUR P) is intravascular absorption of irrigating fluid, causing water intoxication.¹ Several reports of visual disturbances have been attributed to this and include blurred vision,² seeing only a faint glow,³ and blindness.⁴ These visual disturbances are thought to be due to a central mechanism. No documentation of intraocular pressure (IOP) was made in these reports. The purpose of this investigation is to study changes in IOP that may be related to the absorption of irrigating fluid during a TUR P.

Methods. 21 patients between the ages of 54 and 81 (mean age: 67) were scheduled for a TUR P. Approval for the study was granted by the Committee on Human Investigations of the University of Nebraska. Informed consent was obtained. Preoperative electrolyte determination was obtained, visual acuity was examined pre- and postoperatively and preresection tonometry was performed bilaterally with a Schiøtz indentation tonometer. Drug histories were obtained to note any medications which might change the patient's IOP. None of the patients were premedicated. The bladder irrigation solution was 1.5% glycine. Postoperative electrolytes were obtained and indentation tonometry was measured in the recovery room. When the IOP's in cases 1-10 (Na^+ fall > 10 meq/L) were compared to the IOP's in cases 11-21 (Na^+ fall < 10 meq/L) there was no statistical difference with the student-T test at $p=0.1$.

Results. Two of the patients (1 and 2, Table 1) had a history of open angle glaucoma and were being treated with timolol maleate eye drops. These were the only patients who complained of visual disturbances post TUR P. Visual acuity changed from 20/400 to 20/800 in subject #1, and from 20/20 to a level greater than 20/800 in subject #2. This latter subject had a sensation of blurry vision immediately postresection. IOP rose in both cases (but not to abnormally high levels) and serum Na^+ decreased. Subject #2's increase in IOP preceded signs of somnolence, confusion, restlessness, and later seizures in the recovery room. The remaining patients had no change in visual acuity.

Discussion. Hemodilution caused by the oral consumption of large volumes of water will decrease the outflow facility of aqueous humor and increase IOP.⁵ One test, developed for detecting early abnormalities in the resistance to outflow of fluid from the eye, is the Water Drinking Provocative Test.⁵ Within 40 to 45 minutes of drinking one liter of water, a rise in IOP occurs. The absorption of large amounts of hypotonic solution can occur even more rapidly by the intravascular route in a TUR P. Severe acute water intoxication within 15 minutes of resection time has been reported.⁶ Increase in IOP could be explained by glycine absorption, however the increase is not large enough to explain visual difficulties. None of our patients had increases in IOP large enough to be considered pathological. Thus we agree with Defalque

Case#	Anesthetic	Pre-op Na^+ meq/L	Post-op Na^+ meq/L	Pre-op IOP torr	Post-op IOP torr
1	Halothane	142	131	12.0	17.0
2	SAB	135	116	17.0	20.5
3	SAB	143	122	15.8	16.3
4	SAB	140	124	8.5	10.0
5	Halothane	139	119	14.6	18.5
6	SAB	139	122	10.8	14.6
7	Epidural	134	122	16.0	13.4
Narcotic, Thiopental					
8	$\text{N}_2\text{O}/\text{O}_2$	131	102	20.0	20.0
9	SAB	139	114	18.2	12.2
10	SAB	139	125	12.2	12.2
11	SAB	135	131	14.6	12.2
12	SAB	138	140	17.3	14.8
Narcotic, Thiopental					
13	$\text{N}_2\text{O}/\text{O}_2$	138	139	14.8	12.5
14	SAB	143	144	14.8	13.4
15	SAB	138	134	15.2	14.8
16	Halothane	137	142	17.0	16.7
17	Halothane	134	133	14.0	12.2
18	Enflurane	134	134	16.0	16.5
19	SAB	138	137	15.5	15.8
20	SAB	137	134	15.9	15.9
21	SAB	136	132	18.2	21.6

and Miller who felt that cerebral edema was the cause of visual disturbances.³ This study suggests that visual difficulties may occur more frequently in patients with glaucoma but a greater number of patients with glaucoma must be studied before any conclusions can be made. However, any patient that has a visual disturbance post TUR P should have a neurological and ophthalmological examination including tonometry performed. Patients with untreated glaucoma may be at risk for marked increases in IOP and should be monitored with tonometry before and after TUR P.

References

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