



NARROW ANGLE CLOSURE GLAUCOMA: DIAGNOSING WITH SUSPICION IN HIGH RISK

Ophthalmology

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ABSTRACT

Acute angle-closure glaucoma (AACG) is emergency condition and should be diagnosed and treated early..Risk factors include anatomical, and or demographic factors. Drugs known to precipitate AACG attack include adrenergic agonists, anti-cholinergic, cholinergic, sulphonamides, supplements, and serotonergic medications by two mechanisms like Pupillary block: and Non-pupillary block both leading to narrow angle Aim To study the association between glycopyrrolate and acute narrow angle glaucoma in post-operative patients.Objectives : To study the effects of glycopyrrolate on the Intraocular pressure(IOP). Methods Cross-Sectional Descriptive Study conducted in 30 patients who received glycopyrrolate injection during an operative procedure willing to be a part of the study over 18 years of age in department of Ophthalmology at Tertiary Care Hospital for period of 18 months.ResultsBest corrected visual activity (Bcva) preoperatively was 6/9 in 27 patients and in 3 patients it was 6/12 and Bcva postoperatively was 6/9 in 24 patients, 6/60 in 4 patients and 6/36 in 2 patients. IOP was raised in 6 patients and normal in 24 patients measured 24 hrs after surgery. On gonioscopy plateau iris seen in 1 patient and 5 patients had narrow iridocorneal angle. The use of glycopyrrolate significantly associated with raised intraocular pressure Therefore, it is important that ophthalmologists and other doctors prescribing these drugs to patients are aware of the risks

KEYWORDS

Acute Angle-Closure Glaucoma, Glycopyrrolate, intraocular pressure

INTRODUCTION

Acute angle-closure glaucoma (AACG) is an ophthalmological emergency situation. Drug- induced AACG should be recognized and treated promptly to avoid consequences leading to blindness.¹ Risk factors for AACG include shallow anterior chamber, short axial length, plateau iris, thick lens, anteriorly positioned lens, and rarely, an intraocular tumour. Of these, stationary anatomic factors include small anterior chamber width, thick peripheral iris, and a more curved iris. Dynamic factors include decreased iris volume loss and increased choroidal volume. These can be diagnosed by ultrasound biomicroscopy (UBM) and optical coherence tomography (OCT).^{2,3} Other risk factors include advanced age, female sex, Asian ethnicity and family history of AACG. Drugs known to precipitate AACG include adrenergic agonists, anti-cholinergic, cholinergic, sulphonamides, supplements, and serotonergic medications.⁴ There are two mechanisms by which a drug can cause AACG. like Pupillary block causing obstruction of aqueous flow between the lens and pupil, and non-pupillary block causing forward movement of the iris-lens diaphragm. Both the mechanisms result in a pressure gradient between posterior chamber and anterior chamber causing anterior curling of the iris that narrows the iridocorneal angle.⁵

Glycopyrrolate is an anticholinergic drug which is used in anaesthesia in both adult and pediatric patients and it has been reported to have caused bilateral AACG 12 hours postoperatively after it was used for reversal of neuromuscular blockade in cervical spine surgery.⁶

MATERIALS AND METHODS

Study Design:

Cross-Sectional Descriptive Study.

Study Site:

Department of Ophthalmology at Tertiary Care Hospital.

Sample Size: 30 patients

Study Period: 18 months

Inclusion Criteria:

Adult patients who have received glycopyrrolate injection during an operative procedure willing to be a part of the study and who are above 18 years of age. Exclusion Criteria: Patients who are less than 18 years of age, and who are not willing to participate in the study. Ethical clearance was obtained from the Institutional Ethics Committee.

RESULTS

There were 30 patients in our study and there were more males than females Mean age of the participants is 53.77 years with standard

deviation of 10.371 Mean iop of the participants is 13.6 mmhg with standard deviation 2.88 preoperatively while mean iop 24 hrs after surgery was 21.33mmhg with standard deviation 15.347

Mean duration of surgery was 3.93 hrs with standard deviation 0.799

The number of patients were 5 patients with diabetes and 4 hypertensive patients while 21 patients had no comorbidities There were only 2 patients with history of trauma to eyes There were 3 people with past history of any eye disease and family history of glaucoma in seen only in 3 patients

Preoperatively Bcva was 6/9 in 27 patients and in 3 patients it was 6/12 preoperatively and eyes were hyperopes in 7 patients while it was normal in 23 patients Anterior chamber depth was deep in 23 eyes while angle was shallow in 7 patients On gonioscopy plateau iris seen in 1 patient and 5 patients had narrow iridocorneal angle and in rest 24 patients it was normal Surgery was cervical spine surgery performed in 25 patients, 4 patients underwent lumbar spine surgery and 1 patient had posterior fossa surgery.

Colloids was used in 3 patients who suffered severe blood loss There were no symptoms in 24 patients, while complaints of headache, nausea and vomiting were seen in 6 patients Bcva was 6/9 in 24 patients while it was 6/60 in 4 patients and 6/36 in 2 patients postoperatively

Iop was raised in 6 patients and normal in 24 patients 24 hrs after surgery Association of risk factors like age, gender, comorbidities, past history, family history, preoperative ophthalmic findings and position during surgery with raised intraocular pressure in patients was statistically significant

Similarly association of use of glycopyrrolate with raised intraocular pressure in patients was statistically significant

Table no 1 Variables

Age in years	Frequency	Percent
31-40	3	10
41-50	7	23.33
51-60	9	30
61-70	11	36.33
Gender	Frequency	Percent
Females	10	33.33
Males	20	66.67
Total	30	100.0
Comorbidities	Frequency	Percent
diabetes	5	16.67

hypertension	4	13.33
none	21	70
Total	30	100.0
Best corrected visual acuity test preoperative	Frequency	Percent
6/12	3	10
6/9	27	90
Total	30	100.0
Preoperative eye examination	Frequency	Percent
hypermetropia	7	23.33
normal	23	76.67
Total	30	100.0
Anterior chamber depth	Frequency	Percent
deep	23	76.67
shallow	7	23.33
Total	30	100.0
Best corrected visual acuity test postoperative	Frequency	Percentages
6/36	2	6.67
6/60	4	13.33
6/9	24	80
Total	30	100.0
Iop raised postoperative	Frequency	Percent
no	24	80
yes	6	20
Total	30	100.0
Gonoscopy	Frequency	Percent
Narrow iridocorneal angle	5	16.7
plateau iris	1	3.3
normal	24	80
Total	30	100.0

Table no2 Association of various variables with intraocular pressure post surgery

Age	Iop not raised	Iop raised	p value
<60 years	16	3	<0.01
>60 years	8	3	
Total	24	6	
Gender	Iop not raised	Iop raised	<0.01
Females	7	3	
Males	17	3	
comorbidities	no	yes	<0.01
diabetes	3	2	
hypertension	3	1	
none	18	3	
preoperative eye exam	Iop Not raised	Iop raised	<0.01
hypermetropia	2	5	
normal	22	1	
Total	24	6	
surgery	Iop Not raised	Iop raised	<0.01
cervical spine surgery	20	5	
lumbar spine surgery	3	0	
lumbarspine surgery	0	1	
posterior fossa surgery	1	0	
Total	24	6	
Position	Iop Not raised	Iop raised	<0.01
prone	24	6	
other	0	0	
Total	24	6	
use of Glycopyrrolate	Iop Not raised	Iop raised	
yes	24	06	
no	00	00	
Total	24	06	
gonioscopy	Iop Not raised	Iop raised	<0.01
narrow iridocorneal angle	0	5	
normal	23	1	
plateau iris	1	0	
symptoms	Iop Not raised	Iop raised	<0.01
headache	0	1	
nausea	0	2	
nil	14	0	
pain, photophobia	0	1	
red eye, blurry vision	0	1	
vomitting	0	1	
Total	24	6	

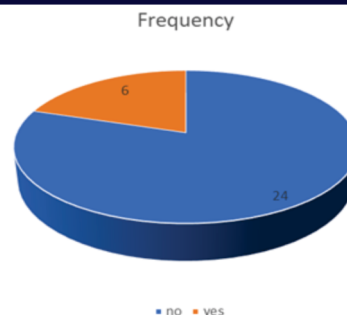


Figure no 1: Iop raised post surgery on tonometry

DISCUSSION

Glycopyrrolate is an antimuscarinic agent used in general anaesthesia during NMB reversal for reduction of airway secretions and to block the muscarinic effects of neostigmine. Glycopyrrolate was given in all patients and narrow angle closure glaucoma was seen in 6 eyes

Majority of the study participants belong to 60 to 70 years age group and there were more males than females and the association with raised intraocular pressure in patients was statistically significant. In study by Ani Khondkaryan it is seen that acute ACG is most common between the ages of 55 and 65 years.⁷

Parul Ichhpujani study it is seen that PACG had an overall peak presentation in the seventh decade 34.8% while the overall mean age at presentation for males was 57.70 years it was significantly higher when compared to mean age of 53.56 years in females ($P < 0.001$). Iop was significantly raised in 6 patients and normal in 24 patients seen 24 hrs after surgery. In study by Parul Ichhpujani et al it is seen that mean IOP at presentation was 18.71 ± 8.43 mmHg in eyes that had received prior medical therapy in 35.7% patients and 18.47 ± 7.11 mmHg in remaining eyes.⁸ In our study none of the patients had surgical correction and were given medical management.

In our study Bcva was 6/9 in 27 patients and in 3 patients it was 6/12 and eyes were hyperopes in 7 patients while normal in 23 patients on preoperative ophthalmic examination. On the other hand Bcva after 24 hours post surgery was 6/9 in 24 patients while it was 6/60 in 4 patients and 6/36 in 2 patients

Our findings are similar with study which is a case report by Mahmoud Jaroudi, et al Ophthalmic examination included Snellen visual acuity of 20/100 in both eyes.⁶

Michael S. Singer case report concluded that It is essential for anesthesiologists and surgeons to be aware of this complication for accurate diagnosis and giving timely intervention.⁹ It is important to see whether the use of colloid to limit the rise in IOP during complex prone spine surgeries is important in maintaining ocular perfusion and reducing the incidence of POVL., especially for patients identified as high risk as seen in study by Travis J Nickels, et al.¹⁰

CONCLUSION

It is seen that surgeries done under general anaesthesia is triggering factor for episode of angle closure glaucoma especially done under prone position or facedown surgeries. Therefore preoperative ophthalmic examination is necessary

Footnotes

Source of Support: Nil

Conflict of Interest: None declared.

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