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KEY WORDS: Uveitis, Lens induced glaucoma and IV methyl prednisolone

ROLE OF INTRAVENOUS METHYL PREDNISOLONE INJECTION IN UVEITIS CAUSED BY LENS INDUCED GLAUCOMA.

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ABSTRACT

The study was prospective randomized controlled conducted on 60 patients of lens induced glaucoma. Preoperatively detailed clinical examination was done. After exclusion criteria we randomly divided patients in two group (30 in each). In control group patients undergone for SICS with trabeculectomy with PCIOL. In study group patients was treated by IV methyl prednisolone 500 mg preoperatively.Postoperative follow up was done on 1,3,7,14day and at 1month. Study group shown significant difference ($p<0.5$) in reduction of uveitis. Postoperative visual outcome was also better in study group (60%).

Introduction

Cataract is the leading cause of blindness stiil in the world. Millions of persons become blind due to cataract every year. lens induced glaucoma is one of the reason for loss of vision.Lens-induced glaucoma in the elderly can be subdivided into two major categories.The first category relates to a blockage of the anterior flow of the aqueous humor from the lens that results in an increase of intraocular pressure (IOP). Conditions included in this category are: (1) pupillary block glaucoma caused by an intumescent cataractous lens (phacomorphic glaucoma), (2) The second category is characterized by the blockage of the trabecular meshwork from lens proteins (phacolytic glaucoma).[1]

When cataract become mature or more precisely intumescence its anteroposterior diameter increases in size which in some patients those have shallow anterior chamber leads to pupillary block and peripheral iridotrabecular apposition which causes rise in intraocular presuure.[2,3] still the role of pupillary block in the pathophysiology of phacomorphic angle-closure is uncertain very Limited evidence suggests that swelling of the lens is only to cause pupillary block [4].When the intraocular pressure (IOP) raise enough to cause the signs and symptoms of an acute attack of secondary angle-closure glaucoma, it is called acute phacomorphic angle-closure and from very early yhis entity was labeled as phacomorphic glaucoma. it has been cited as the cause of 3.9% of cataract extractions done in India. [5]

second one is the result of the leakage of lens material from senile hypermature or Morgagnian cataract through an intact lens capsule .patients present with a red and painful eye,diminution of visual acuity occurs due to maturation of the cataract and corneal edema, high IOP and an open angle seen in gonioscopy,a heavy flare, and aqueous cells larger than the lymphocytes seen in uveitis.[6] There are two theory about the pathogenesis of this condition first one said that the macrophages were the major culprit of increase in IOP by blocking the trabecular meshwork[7,8] second one research by Epstein and colleagues[9] Yanoff and Scheie,[6] and Dueker[10] emphasized the role of heavy molecular proteins (HMW) leaking from the lens in the obstruction of the aqueous outflow and deemphasized the role of the macrophages.

Clinical picture in both of these condition are same i.e.pain ,redness,watering and photophobia except the depth of anterior chamber. Which remains shallow in phacomorphic and deeper one in phacolytic .

The most common initial treatment is topical anti-glaucoma eye drops which include beta-blockers, alpha-agonists, and carbonic anhydrase inhibitors.[11] Several studies relied on a standard treatment protocol timolol eye drop, acetazolamide orally and intravenous mannitol(12,13). [11,18]. If topical treatment fails to bring the IOP into a tolerable range until cataract extraction can be performed .The two most common methods for removing the mature lens are extracapsular extraction(sics) or phacoemulsification[14] Extra-capsular cataract extraction has been used successfully, especially Manual Small-Incision Cataract Surgery (SICS) along wiyh trabeculectomy.[15]

Methyl prednisolone is also used as to reduce anterior chamber reaction before going to surgery.it is a glucocorticoid have been used for mainy ophthalmic problems like iridocylitis,optic neuritis,sympathetic ophthalmitis etc.[16]

Aim of this study is to evaluate the role of methyl prednisolone intravenously in reducing anterior chamber reaction when given preoperatively.

Material and Methods

This is a prospective randomized controlled study conducted on 60 patients of lens induced glaucoma in the department of ophthalmology at Jhalawar medical college.

Patients were diagnosed as a case of lens induced glaucoma on the basis of sign and symptoms which were presence of intumescent cataract with redness,pain ,watering and diminution of vision and IOP more than 25 mmhg.

Detailed clinical examination of both eyes included the status of lens ,depth of anterior chamber by slit lamp.IOP was measured by schiotz tonometer.Patients were diagnosed as phacomorphic on the basis of ac depth if it was shallow and phacolytic if it was deep along with severe pain, redness and watering.

After obtaining informed consent and explanation relating guarded visual prognosis to the patient.irrespective of diagnosis either phacomorphic or phacolytic glaucoma would subjected to SICS with trabeculectomy with PCIOL under peribulbar anesthesia.

Exclusion criteria

1. Those patients who were suffering from peptic and gastric ulcer.
2. Those patients who were suffering from diabetes mellitus.
3. Those patients who had hypertension.
4. Those patients who were were suffering from any severe systemic disease.

Inclusion criteria

All the patients coming in OPD with intumescent cataract, pain ,redness watering.

All selected patientsrandomly divided in two group (30 in each)

1. Study group (30 cases) these patients undergo SICS with trabeculectomy with pciol.but in this group patients we gave iv methyl prednisolone preoperatively.
2. Control group (30 cases) these patients undergo SICS with trabeculectomy.

Methodology

Inj. Methyl prednisolone 500 mg was dissolved in 250 cc of NS and was infused intravenously slowly within 4-6 hr in study group patients,than all patients of the study and control group were undergone for combined procedure i.e.(SICSwith trabeculectomy with pciol)

Post operatively all patients receieved antibiotic and steroid eyedrop every 4 hrly. follow up was done on 1st ,3rd ,7th 14th and 30th day regarding visual aquity,iop,aqueous cells and aqueous flare.

Result

Table no.1 Distribution of cases according to age group.

Age group	No.of patients	Percentage(%)
40-50 years	12	20%
51-60 years	18	30%
61-70 years	24	40%
>70 years	06	10%
Total	60	100%

Table No.2 Distribution of cases according to gender.

	Male	Female	Total	Chi square	P value	significance
Study group	10 (33.33 %)	20 (66.66%)	30	1.364	0.2428 P > 0.05	Not significant
Control group	06 (20%)	24 (80%)	30			
Total	16 (26.66 %)	44 (73.3%)	60(100 %)			

Table No.3 Demographic profile of the patients.

	Rural	Urban	Total	Chi square	P value	significance
Study group	26 (86.66%)	04 (13.33%)	30	1.667	0.19 P > 0.05	Not significant
Control group	22 (73.33%)	08(26.66 %)	30			
Total	48 (80%)	12(20%)	60(100 %)			

Table No.4 Distribution of cases according to types of lens induced glaucoma.

	Phacomorphic	Phacolytic	Total	Chi square	P value	Significance
Study group	22(73.33 %)	08(26.66 %)	30	0	1 P > 0.05	Not significant
Control group	22 (73.33%)	08(26.66 %)	30			
Total	44 (73.33%)	16(26.66 %)	60(100 %)			

Table No.5 Distribution of cases according to IOP level.

	group	IOP(mmhg)								
		<20	20-25	25-30	30-40	> 40	total	chisquare	P value	significance
preoperative	study	00	00	02	08	20	30	2.083	0.720 P>0.05	NS
	control	00	00	00	09	21	30			
Post op	1st	study	14	10	04	02	00	30	0.362	0.985 P>0.05	NS
		control	13	12	03	02	00	30			
	3rd	study	18	10	02	00	00	30	0.076	0.999 P>0.05	NS
		control	17	11	02	00	00	30			
	7th	study	23	07	00	00	00	30	1.022	0.906 P>0.05	NS
		control	22	07	01	00	00	30			
	14th	study	25	05	00	00	00	30	0.111	0.99 P>0.05	NS
		control	24	06	00	00	00	30			
	30th	study	29	01	00	00	00	30	0.351	0.986 P>0.05	NS
		control	28	02	00	00	00	30			

Table No.6 Distribution of cases according to aqueous cells in both groups.

		group	Aqueous cells									
			0	1-5	6-10	11-20	21-50	> 50	total	chisquare	P value	Significance
preoperative		study	03	08	09	08	02	00	30	4.138	0.529 P>0.05	NS
		control	00	06	10	12	02	00	30			
Post op day	1st	study	20	08	02	00	00	00	30	18.255	0.002 P<0.05	Significant
		control	05	12	09	04	00	00	30			
	3rd	study	24	05	01	00	00	00	30	17.978	0.002 P<0.05	Significant
		control	07	15	05	03	00	00	30			
	7th	study	26	04	00	00	00	00	30	13.098	0.02 P<0.05	Significant
		control	13	13	03	01	00	00	30			
	14th	study	29	01	00	00	00	00	30	11.908	0.03 P<0.05	Significant
		control	18	11	01	00	00	00	30			
	30th	study	30	00	00	00	00	00	30	12.987	0.02	Significant
		control	20	10	00	00	00	00	30			

Table No.7 Distribution of cases according to aqueous flare in both groups.

		group	Aqueous flare								
			NO	Just detectable	Moderate(iris detail clear)	Marked(iris detail not clear)	Intence flare	total	Chi square	P value	Sig.
preoperative		study	00	07	10	12	01	30	2.994	0.700 P>0.05	NS
		Control	00	04	08	14	04	30			
Post op	1st	study	14	13	03	00	00	30	12.556	0.013 P<0.05	Sig.
		Control	04	13	09	04	00	30			
	3rd	study	20	08	02	00	00	30	14.205	0.006 P<0.05	Sig.
		Control	06	16	06	02	00	30			
	7th	study	21	09	00	00	00	30	9.532	0.04 Ÿ P<	Sig.
		Control	11	17	02	00	00	30			
	14th	study	28	02	00	00	00	30	11.352	0.02 P<0.05	Sig.
		Control	18	11	01	00	00	30			
	30th	study	30	00	00	00	00	30	12	0.017	Sig.
		Control	20	10	00	00	00	30			

Table No.8 Distribution of cases according to Visual aquity (BCVA)

	group	Visual aquity(BCVA)								
		PL&PR PRESENT	HM Present close to face	FC3 mtr-FC1 mtr	6/60-1/60	6/36-6/18	6/12-6/6	total	Chi square	P value	Sig.
Preoperative	study	24	04	01	01	00	00	30	1.843	0.764	NS
	Control	27	02	01	00	00	00	30			

Post op day	1st	study	00	00	00	02	24	04	30	24.6 07	0.00 016 P< 0.05	Sig.
		Control	00	01	02	17	10	00	30			
	3rd	study	00	00	00	00	25	05	30	31.4 29	0.00 000 7 P < 0.05	Sig.
		Control	00	00	01	19	10	00	30			
	7th	study	00	00	00	00	18	12	30	12	0.03 4 P<0. 05	Sig.
		Con	00	00	00	10	12	08	30			
	14th	study	00	00	00	00	06	24	30	17.3 97	0.00 380 P < 0.05	Sig.
		Control	00	00	00	08	13	09	30			
	30th	study	00	00	00	00	03	27	30	11.5 40	0.04 P < 0.05	Sig.
		Control	00	00	00	01	14	15	30			

Discussion :

According to table no.1 the incidence of lens induced glaucoma was higher 61-70 yr of age group patients.This observation of our study was supported by various studies performed on lens induced glaucoma, such as Rohtagi et al[17](19 out of maximum number of patients were 46 were of the age group 60 years and above constituting 41.3%.)The age incidence rises sharply at 60 years, Angara etal[18]The age of the patients ranged from 50-80 years with the mean age being 64 years,55% cases were in the age group between 50-60 year,30% between 61-70 years and 15 % between 71-80 years.) Graham etal[19] (Phaco anaphylactic endophthalmitis and lens induced Uveitis are more common in the elderly population with a peak incidence in the 6th to 7th decades). Pradhan etal[12](maximum number of patients of lens induced glaucoma were more than 60 years of age group).

Table no. 2 showed that lens induced glaucoma was more prone in females (44 out of 60)in comparision of male(16 out of 60). Jain etal [19](40 males and 46 females out of 86 patients of lens induced glaucoma.Rohtagi etal[17](29 females and 19 males out of 48 patients study on lens induced glaucoma). Prajana etal[20](Females seems to have a statistically marginally significant increased risk (p=0.05) of lens induced glaucoma). Das jay Chandra etal.[21] Studied 15 patients of phacomorphic glaucoma out of which 11 were females and 4 were males which was in favour of our study.However Singh etal[22] had found 2 females and 3 males in his study of phacolytic glaucoma showed less female to male ratio which was in against of our study which was due to small sample size we expect that the ratio had been surely increased if number of cases in the study increased sufficiently. One small study (49 patients) found that patients over 60 years old had an increased risk (odds ratio 2.7) of developing phacomorphic angle-closure(20) .

Table no. 3 showed the demograohic profile of patients according to it lens induced glaucoma was remarkably profund in rural area (80%) in comparison to urban area(20%). Which was because of low medical awareness,poor socioeconomic status and limited sources as per study of Jay Chandra etal.[21]

Table no.4 showed highest number of phacomorphic glaucoma case (73.33%).That data was supported by Pradhan et al[12] (study 72% caes are of phacomorphic glaucoma which was also in support of our study).

Table no.5 showed the IOP of patients at the time of presentation for treatment which was ranged from 20-40mmhg in both of these groups maximum number of patients had IOP more than 40 mmhg(study group 66.66% and in control group 70%) that observation was supported by Prajna etal[20] which showed that mean preoperative IOP was 42±12 mmhg(range 22-70 mmhg).

Post operatively in both group after combined surgery IOP control was good 80% patients in both group have iop in range of 20-25 mmhg on day 1 of surgery.at the interval of 1 month of surgery 99% of patients in both group had iop <20 mmhg.that observation showed that combined procedure for lens induced glaucoma is better in terms of IOP control as suggested byyanoff[23],Tanito[24],Mandal[25],Rockwood [26] etc. There was no statistically significant difference seen regarding IOP in both groups.

Table no.6 showed that in study group 30% and in control group 33.33% of patients showed moderate anterior chamber reaction(aqueous cells 6-10) No caes in both group showed severe reaction.

Post operatively on day 1, 10 cases in the study group and 05 cases in the control group showed no reaction ,moderate reaction was seen in 02 cases in study group and in 04 cases in control group at day 30 most of the cases in both group showed improvement regarding aqueous cells.These Results of our study supported by Meaock etal[27] and Elgohary etal [28] who conducted that preoperative doses of methylprednisolone play just remarkable role in the treatment of patients of Uveitis.

Table no. 7 showed that 40 % case in study group and 46.66% in control group had marked aqueous flare preoperatively. postoperatively on day 1 in study group 33.33% and 13.33% in control group of patients had no aqueous flare on day 30, 90% of patients in study group and 73.33% of patients in control group had no reaction. Supported by Meaock etal(27) and Elgohary etal (28).

Table no.8 showed in study group 80% and in control group 33.33% patients had bcva 6/36-6/18. On day 1. On day 30 90% of case in study group and 50% in control group had 6/12-6/6 visual outcome which were supported by Prajana etal (20),Pradhan etal.(12)

Conclusion :

1. The incidence of decrease in anterior chamber reaction was better in study group in whom iv methyl prednisolone was given preoperatively
2. Methylprednisolone iv is good to reduce aqueous cells.

References :

1. Dimitris Papaconstantinou,Ilias Georgalas,Nikos Kourtis etal, Lens-inducedglaucoma in the elderly. Clinical Interventions in Aging 2009:4 331–336
2. Lee JW, Lai JS, Yick DW, Tse RK (2010) Retrospective case series on the longterm visual and intraocular pressure outcomes of phacomorphic glaucoma. Eye (Lond) 24: 1675-1680.
3. Ritch R, Shields MB, Krupin T (1996) The glaucomas. (2nd edn) Mosby, St. Louis.
4. Tomey KF, al-Rajhi AA (1992) Neodymium:YAG laser iridotomy in the initial management of phacomorphic glaucoma. Ophthalmology 99: 660-665.
5. Steinert RF (2010) Cataract surgery: techniques, complications and management. (3rd edn) Saunders, Philadelphia
6. Yanoff M, Scheie HG. Cytology of human lens aspirate. Its relationship to phacolytic glaucoma and phacoanaphylactic endophthalmitis. Arch Ophthalmol. 1968;80:166–170.
7. Flocks M, Littwin CS, Zimmerman LE. Phacolytic glaucoma: a clinicopathological study of 138 cases of glaucoma associated with hypermature cataract. Arch Ophthalmol. 1955;54:37–45.
8. Irvine SR, Irvine AR Jr. Lens-induced uveitis and glaucoma. I. Endophthalmitis phaco-anaphylactica. Am J Ophthalmol. 1952;35:177–186.
9. Epstein DL, Jedziniak J, Grant WM. Identification of heavy molecular weight soluble protein in aqueous humor in human phacolytic glaucoma. Invest Ophthalmol Vis *Sci.* 1978;17:398–402.
10. Feder RS, Dueker DK. Can macrophages cause obstruction to aqueous outflow in rabbits? Int Ophthalmol. 1984;7(2):87–93.
11. Sowka J (2006) Phacomorphic glaucoma: case and review. Optometry 77: 586-589.
12. Pradhan D, Hennig A, Kumar J, Foster A (2001) A prospective study of 413 cases of lens-induced glaucoma in Nepal. Indian J Ophthalmol 49: 103-107
13 Ramakrishanan R, Maheshwari D, Kader MA, Singh R, Pawar N, et al. (2010) Visual prognosis, intraocular pressure control and complications in phacomorphic glaucoma following manual small incision cataract surgery. Indian J Ophthalmol 58: 303-306.
14 Lee JW, Lai JS, Yick DW, Tse RK (2010) Retrospective case series on the

longterm visual and intraocular pressure outcomes of phacomorphic glaucomalongterm visual and intraocular pressure outcomes of phacomorphic glaucoma. Eye (Lond) 24: 1675-1680.
15. Venkatesh R, Tan CS, Sengupta S, Ravindran RD, Krishnan KT, et al. (2010) Phacoemulsification versus manual small-incision cataract surgery for white cataract. J Cataract Refract Surg 36: 1849-1854.
16 Collin Dollery.Therapeutic Drugs.Ed 2nd ,2001
17. Rohatagi JN.Lens induced glaucoma-Aclinical study.Indian J Ophthalmol.1972:20(2);88-93
18. Angara SK, Pradhan R,Garg SP.Cataract induced glaucoma-An insight into management.Indian J Ophthalmol.1991:39(3);97-101.
19 IS Jain, Amod Gupta, MR Dogra, DN Gangwar, SP Dhir . Phacomorphic glaucoma-management and visual prognosis.Indian J of Ophthalmol. 1983: 31:(5);648-653.PMID:6671784.
20 N Venkatesh Prajna, R Ramakrishnan, R Krishnadas, N Manoharn. Lens induced glaucomas - visual results and risk factors for final visual acuity. Indian J of Ophthalmol. 1996: 44: (3); 149-155.PMID:9018992
21 Jaya Chandra Das, Z Chaudhuri, S Bhomaj, P Sharma, R Gupta, D Chauhan. Combined extracapsular cataract extraction with ahmed glaucoma valve implantation in phacomorphic glaucoma. Indian J of Ophthalmol. 2002: 50: (1);25-28 PMID: 12090083
22. Singh G, Kaur J, Mall S. Phacolytic glaucoma-its treatment by planned extracapsular cataract extraction with posterior chamber intraocular lens implantation. Indian J Ophthalmol. 1994, 42:145-147.
23. Yanoff M,DukerJS.Ophthalmology.2004,2:1201-1204.
24. Tanito M,Chihara E.Surgical outcome of combined trabeculectomy and cataract surgery.J of Glaucoma.2001,10(4):302-308.
25. AK Mandal. An alternate way to manage patients with morgagnian cataracts and phacolytic glaucoma. Indian J of Ophthalmol. 1997: 45: (1); 53-59 PMID: 9475014
26. Rockwood E.Outcomes of combined cataract extraction,lens implantation, and trabeculectomy surgeries.Am J Ophthalmol.2003;130(6):704-711.
27. Meacock WR,Spalton DJ,Bender L. etal. Steroid prophylaxis in eyes with Uveitis undergoing phacoemulsification.Br J Ophthalmol 2004,88(9):112-1124
28. Elgohary MA, McCluskey PJ. etalOutcome of phacoemulsification in patients with Uveitis. Br J Ophthalmol 2007,91:916-921.