



## **A CLINICAL COMPARISON OF EFFICACY AND SAFETY OF BIMATOPROST/TIMOLOL AND TRAVOPROST/TIMOLOL IN GLAUCOMA PATIENTS**

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### **ABSTRACT**

The studies on Clinical comparison of the efficacy and safety of Bimatoprost/Timolol combination and Travoprost/Timolol combination in glaucoma patients were carried out in a Vasana Eye Care Hospital located at Tiruchirappalli. The hospital is unique and well known for its services, to people who come from all over the district and various parts of the country. This study was designed to compare the efficacy and safety of Bimatoprost/Timolol combination and Travoprost/Timolol combination in glaucoma patients. This study included 30 glaucoma patients, based on the inclusion and exclusion criteria. From the selected 30 patients, 15 patients were treated with Bimatoprost/Timolol combination (Group A) and remaining 15 patients were treated with Travoprost/Timolol combination (Group B). In this study initial readings were considered as base, First Review values taken at the end of 2<sup>nd</sup> week and the Second Review values taken at the end of 6<sup>th</sup> week. Bimatoprost/Timolol combination and Travoprost/Timolol combination does not have any effect on Visual acuity, Pupil size, Blood pressure and Pulse rate. The present study concluded that, adverse drug reactions of Travoprost/Timolol combination were less than the Bimatoprost/Timolol combination. Further, the pharmacoeconomic study (cost effective analysis) revealed that Bimatoprost/Timolol combination is cost effective than Travoprost/Timolol combination. Due to the patient counseling, the patient's knowledge about glaucoma, its drug usage and patient compliance is improved.

**Key Words:-** Glaucoma, Bimatoprost/Timolol, Travoprost/Timolol, Adverse Drug Reactions.

### **INTRODUCTION**

Glaucoma has been declared to be the second common cause of blindness in adult population in India. Experts estimate that half of those affected by glaucoma may not know they have it because there are normally no

symptoms during the early stages of the disease. Worldwide, glaucoma affects close to 67 million people. Glaucoma is called "the sneak thief of sight," because it often has no symptoms until permanent visual damage has occurred. Although it can be treated, currently there is no cure. Vision lost to glaucoma cannot be regained, and untreated glaucoma leads to blindness (Anonymous 1). Ultimately, the objective is to allow the patient to maintain useful vision throughout their life, while minimizing the risks of therapy (Anonymous 2). The incidence of closed-

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angle glaucoma varies by ethnic group, with a higher incidence in individuals of Inuit, Chinese, and Asian-Indian descent. Incidence rates of 1% to 4% have been reported in these populations (Joseph TD *et al.*, 2002). Currently, prostaglandin analogues and beta-blockers are the most frequently used topical medications. Sympathomimetics, topical and oral carbonic anhydrase inhibitors, and cholinergics are used to a lesser degree. Adverse effects or inadequate clinical response may necessitate a therapeutic change, while drugs with different mechanisms of action may be used in combination to maximize IOP reduction (Anonymous 3).

## MATERIAL AND METHODS

The studies on “Clinical comparison of the efficacy and safety of Bimatoprost/Timolol (Anonymous 4, 5) combination and Travoprost/Timolol(Anonymous 5, 6) combination in glaucoma patients” were carried out in a Vasan Eye Care Hospital located at Tiruchirappalli. The hospital is unique and well known for its services, to people who come from all over the district and various parts of the country.

Patients selected for the study were out patients from glaucoma department. It is customary that every project work carried out in the hospital by the department of pharmacy practice has to be approved by the Managing Director and should be informed to all physicians, surgeons and other healthcare professionals of the hospital. So a protocol of the study, which includes the objectives, methodology, etc., was submitted the Managing Director of the study hospital. The authorization from the Managing Director was procured on conducted with the expert guidance of clinical pharmacy professionals, senior and junior physicians of the department selected for the study in the hospital. The author was permitted to utilize the hospital facilities to make a follow up prescription, in the selected departments. All the health care professionals were well informed through managing director official circular.

### Study Design

#### Patient Selection

The Patient has been selected based on the following inclusion and exclusion criteria.

#### Patient Inclusion criteria

- a) 35 years of age or older.
- b) Patients with
  1. Primary open angle glaucoma.
  2. Pseudofoliate open angle glaucoma.
  3. Pigmentary glaucoma.
  4. Ocular hypertension.

- c) I.O.P in each eye should be more than  $\geq 22$ mmHg.

#### Patient Exclusion Criteria

Patients with

- a) Chronic use of ocular medication other than the study medications during the trial.
- b) Pregnant or nursing females.
- c) Patient with corneal abnormality or any condition that prevented related applanation tonometry.
- d) Patients with ocular inflammation or history of renal or hepatic impairment.

#### Design of Data Entry Format [Proforma]

A separate data entry format [Proforma] for incorporating patient's details was designed. The format contains details such as Name, Age, Diagnosis, Medication History etc.

#### Proforma I

Patient informed consent form

#### Proforma II

Patient details-Name, Age, Sex, Address, Occupation, Social History, Diagnosis, Personal history, Past Medication History, Family History, Allergy etc.

#### Proforma III

Investigation chart –It includes  
Ocular – Iris color, Pupil size, Visual acuity, Intraocular pressure (IOP), Visual field.  
Systemic – Blood Pressure, Pulse rate.

#### Proforma –IV

Adverse drug reaction report form. Adverse drug reactions are monitored at the end of 2<sup>nd</sup> and 6<sup>th</sup> week.

#### Proforma –V

Patient Education Form.

This form contains 30 questionnaires to provide patient education. Each question were asked to the patient during their initial visit (base level) then the patient education is provided and again the same questions were asked to the patient during their second review. The percentage of improvement in patient knowledge was calculated.

## PATIENT DATA ANALYSIS

Collected information were analyzed by using suitable statistical methods

## STUDY METHODOLOGY

- This prospective study comprised of 30 Glaucoma patients.
- The patient has been selected according to the inclusion and exclusion criteria
- The patients were assigned to 2 groups of 15 each.

- Bimatoprost/Timolol – 15 Patients (Group A)
- Travoprost/Timolol – 15 Patients (Group B)
- The baseline IOP was measured by Goldmann Applanation Tonometer.
- The IOP was again measured with the same Goldmann Applanation Tonometer at the 1<sup>st</sup> and 2<sup>nd</sup> review.

### PHARMACOECONOMICS STUDY

Pharmacoeconomic study was carried out. In pharmacoeconomics study cost effective analysis was performed to find out the most cost effective combination (Bimatoprost /Timolol and Travoprost/Timolol) to treat glaucoma.

### RESULTS AND DISCUSSION

This study was designed to compare the efficacy and safety of Bimatoprost/Timolol combination and Travoprost/Timolol combination in glaucoma patients. This study included 30 glaucoma patients, based on the inclusion and exclusion criteria. From the selected 30 patients, 15 patients were treated with Bimatoprost/Timolol combination (Group A) and remaining 15 patients were treated with Travoprost/Timolol combination (Group B). In this study initial readings were considered as base, First Review values taken at the end of 2<sup>nd</sup> week and the Second Review values taken at the end of 6<sup>th</sup> week.

Adverse drug reactions for both Group A and Group B patients were monitored at the end of 2<sup>nd</sup> and 6<sup>th</sup> week review. Patient education also provided at the initial (base) level and the patient knowledge about glaucoma & its medication use before and after patient education is assessed using patient education form (Proforma 5).

Out of the selected 30 patients, 2 patient (7%) were in the age group of 35- 40 years, 5 patients (16%) were in the age group of 41-50 years, 12 patients (40%) were in the age group of 51-60 years, 5 patients (17%) were in the age group of 61-70 years, 5 patients (17%) were in the age group 71-80 and 1 patient ( 3%) were in the age group of 81-90. It indicates that the chance of getting glaucoma is high between 51-60 years from my study. (Table 1 and Figure 1).

Out of the selected 30 patients, 21 patients (70%) were males and the remaining 9 patients (30%) were female, which confirms that men are more likely to have glaucoma than females. (Table 2 and Figure 2). Previously same findings was reported (Eric TH *et.al.*, 2000).

Out of the selected 30 patients, 5 patients had only hypertension, 3 patients had only diabetes mellitus, 1 patient had thyroid disorder, 1 patient had hypertension, Diabetes mellitus and Cardiac disorders, 5 patient had

both diabetes mellitus and hypertension, 1 patient had hypertension and cardiac disorder, 1 patient had cancer, 13 patients were of neither hypertension, cardiac disorders nor diabetes mellitus (Table 3 and Figure 3). These observations also confirm that diabetes mellitus and hypertension increase the risk of glaucoma (Anonymous 4).

Out of the selected 30 patients, 4 patients (13%) had family history of Glaucoma, and 26 patients (87%) had no family history of Glaucoma. (Table 4 and Figure 4). Previous study reported that 60% of POAG is familial (Sohan SH, 2007). But perhaps due to small sized population the results of our study were not similar with previous study.

An attempt was made to identify and analyze the adverse reaction of both Bimatoprost/Timolol combination and Travoprost/Timolol Combination. The analysis revealed that in Group A 7 patients (46%) had eye irritation, 1 patient (6% ) had Lachrymation, 2 patients (14%) had head ache, 1patient (6%) of had photophobia, 6 patients (40%) had redness, 1 patient(6%) had back pain and 7 patients (46%) had conjunctival hyperemia. In Group B 5 patients (34%) had conjunctival hyperemia, 1 patient (6%) had blackish discoloration .This is shown in (Table 5 and Figure 5).

Table 6 and 7 shows the values of IOP, Visual Acuity, Pupil Size for all patients in Group A (Bimatoprost/Timolol) and Group B (Travoprost/Timolol) respectively. Figure 6 shows the gradual reduction of IOP for both Group A and Group B patients during two months of treatment.

Table 8 indicates the mean and standard deviation of IOP, visual Acuity, Pupil Size for two groups of patients. It is found from this table, IOP level decreases significantly in two groups (Group A and B). Although the decrease level of Group B (Travoprost/Timolol) is higher than that of Group A (Bimatoprost/Timolol). Both the combination drugs do not have any significant change in visual acuity, and pupil size.

Table 9 and 10 show the blood pressure and pulse rate in Group A and B in all patients. In table 11 indicates the mean change of systolic, diastolic blood pressure and pulse rate in Group A and B patients. This clearly indicates that, both drug combinations do not have any influence on Blood pressure and Pulse rate.

Table 12 and 13 indicates the cost details and cost effective analysis of Bimatoprost/Timolol combination and Travoprost/Timolol combination respectively. This table results shows that when the cost is considered Travoprost/timolol Combination is costlier than Bimatoprost/timolol Combination. But the efficacy to reduce the level of IOP is more in Group B

(Travoprost/Timolol combination) than in Group A (Bimatoprost/Timolol Combination), Adverse drug reactions of combination B is less than combination A (see table 5).

Table 14 indicates the impact of patient education (counselling) of patient knowledge about that diseases, medication usage. It clearly indicates that patient

knowledge about the diseases; medication use and storage have been improved after patient education (counselling). It shows the importance of patient counselling to improve therapeutic outcomes. Further it confirms the patient counselling can improve the patient compliance and adherence to therapy.

**Table 1. Categorization of Patients (N= 30) according to Age**

Age in years	No of Patients	% of Patients
35-40	2	7
41-50	5	16
51-60	12	40
61-70	5	17
71-80	5	17
81-90	1	3

**Table 2. Categorization of Patients (N=30) according to sex**

Sex	No of Patients	% of Patients
Male	21	70
Female	9	30

**Table 3. Categorization of Patients (N=30) according to associated diseases**

Diseases	No of Patients	% of Patients
Hypertension	5	17
Diabetes	3	10
Thyroid	1	3
DM & HT	5	17
HT, DM& Cardiac disorders	1	3
HT & Cardiac Disorders	1	3
Cancer	1	3
None	13	44

**Table 4. Categorization of Patients According To Family History of Patients with Glaucoma**

Family history	No of Patients	% of Patients
Yes	4	13
No	26	87

**Table 5. Adverse Drug Reactions of Group A (Bimatoprost /Timolol) and Group B (Travoprost / Timolol) Patients**

Adverse drug reaction	Bimatoprost/Timolol (N=15)		Travoprost/Timolol (N=15)	
	N	%	N	%
Eye irritation/Foreign body sensation	7	46	-	-
Pain in the eye	1	6	-	-
Lacrimation	1	6	-	-
Brow ache/Head ache	2	14	-	-
Photophobia	1	6	-	-
Redness	6	40	-	-
Back pain	1	6	-	-
Conjunctival hyperemia	7	46	5	34
Others (Blackish discoloration)	-	-	1	6

**Table 6. Patients on Treatment with Bimatoprost/Timolol Combination (Group A)**

Patient Id	IOP (mmHg)			Visual Acuity			Pupil size (mm)		
	Base	Rev I	Rev II	Base	Rev I	Rev II	Base	Rev I	Rev II
B <sub>1</sub>	22	13	13	6/9	6/18	6/9	2.9	2.9	2.9
	18	12.5	12	6/6	6/6	6/6			
B <sub>2</sub>	22	14	12	6/18	6/6	6/6	3.0	3.0	3.0
	24	14	12	6/6	6/6	6/6			
B <sub>3</sub>	30	16	14	6/6	6/6	6/6	3.1	3.1	3.1
	30	16.5	15	6/6	6/6	6/12			
B <sub>4</sub>	22	17	16	6/9	6/18	6/36	3.1	3.1	2.1
	24	17	14	6/6	6/6	6/6			
B <sub>5</sub>	32	16.5	14.5	6/24	6/6	6/6	3.2	3.2	3.2
	34	18	15.5	6/6	6/6	6/18			
B <sub>6</sub>	28	20.5	15	6/6	6/12	6/6	3.1	3.1	3.1
	32	18.5	15	6/60	6/60	6/60			
B <sub>7</sub>	24	17	14	6/18	6/9	6/6	2.9	2.8	2.8
	26	18	16	6/6	6/9	6/9			
B <sub>8</sub>	16	12	12	6/9	6/6	6/36	2.9	2.9	2.9
	16	12	12	6/6	6/6	6/6			
B <sub>9</sub>	34	28	13	6/6	6/9	6/18	3.1	3.1	3.1
	30	24	14	6/6	6/6	6/6			
B <sub>10</sub>	30	17	16.5	6/9	6/6	6/6	2.9	2.9	2.9
	14	14.5	13	6/9	6/18	6/18			
B <sub>11</sub>	22	19	14	6/24	6/6	6/6	3.1	3.1	3.1
	22	16	14.5	6/6	6/6	6/6			
B <sub>12</sub>	25	16	15	6/6	6/9	6/9	2.7	2.7	2.7
	28	24	15	6/6	6/6	6/6			
B <sub>13</sub>	22	15.5	14	6/6	6/6	6/6	3.0	3.0	3.0
	22	17.5	14	6/12	6/18	6/18			
B <sub>14</sub>	24	17.5	13	6/9	6/9	6/9	2.8	2.8	2.8
	32	16.5	15	6/6	6/6	6/6			
B <sub>15</sub>	30	14	12	6/6	6/6	6/6	3.2	3.2	3.1
	30	14	12	6/9	6/9	6/9			
Mean	25.50	17.07	13.47	0.78	0.79	0.75	3.00	2.99	2.92
±STDE	±4.90	±3.54	±1.27	±0.28	±0.29	±0.31	±0.14	±0.15	±0.26
P- Value Vs Base Value by student t test			<0.0001			NS			NS

NS -Non significant

**Table 7. Patients on Treatment with Travoprost/ Timolol Combination (Group B)**

Patient Id	IOP ( mmHg)			Visual Acuity			Pupil size ( mm)		
	Base	Rev I	Rev II	Base	Rev I	Rev II	Base	Rev I	Rev II
T <sub>1</sub>	42	22	18.5	6/6	6/6	6/6	3.1	3.1	3.1
	42	22	19.5	6/24	6/6	6/9			
T <sub>2</sub>	26	22	20	6/6	6/6	6/6	3.8	2.8	2.9
	26	22	18	6/9	6/6	6/6			
T <sub>3</sub>	24	12	12	6/9	6/6	6/6	2.8	2.8	2.8
	24	12	12	6/18	6/6	6/6			

T <sub>4</sub>	32 22	24 20	18 18.5	6/6 6/6	6/6 6/6	6/6 6/6	3.1	3.1	3.1
T <sub>5</sub>	26 30	18 17	16 15	6/9 3/60	6/6 3/60	6/6 3/60	3.0	3.1	3.0
T <sub>6</sub>	36 30	19 16	17.5 14.5	6/6 6/18	6/9 6/9	6/6 6/9	2.8	2.8	2.8
T <sub>7</sub>	26 52	20 14	18 13.5	6/60 6/12	6/60 6/6	6/60 6/9	2.9	2.9	2.9
T <sub>8</sub>	20 17	13 15	14 14	3/60 6/6	3/60 6/6	3/60 6/6	3.1	3.1	3.1
T <sub>9</sub>	25 18	18 18	18 16	6/6 6/6	6/6 6/6	6/6 6/6	3.0	3.0	3.0
T <sub>10</sub>	42 52	18 18	17.5 17	6/12 6/12	6/18 6/18	6/18 6/6	2.9	2.9	2.9
T <sub>11</sub>	30 22	24 20	16.5 16.5	6/9 6/9	6/6 6/6	6/6 6/9	3.1	3.1	3.1
T <sub>12</sub>	42 36	23 20	18 18	6/12 6/6	6/18 6/6	6/6 6/18	3.0	3.0	3.0
T <sub>13</sub>	34 31	14 14	16 16	6/12 6/18	6/6 6/18	6/6 6/6	3.1	3.1	3.1
T <sub>14</sub>	50 40	21 12	17 12.5	6/6 6/9	6/6 6/9	6/6 6/6	3.0	3.0	3.1
T <sub>15</sub>	40 38	28 16	20 15.5	6/18 6/12	6/9 6/6	6/6 6/6	3.0	3.0	3.0
Mean	32.50	18.33	16.43	0.62	0.79	0.85	3.04	2.98	2.99
±STDE	±8.89	±3.41	±1.92	±0.31	±0.26	±0.24	±0.23	±0.11	±0.11
P- Value Vs Base Value by student t test	<0.0001					NS			NS

NS- Non significant

**Table 8. Mean ± SD and Mean Changes of IOP, Visual Acuity, & Pupil Size in Group A & B**

S.no	Parameters	Group A Bimatoprost/timolol			Group B Travoprost/timolol		
		Base	Review II	Mean change	Base	Review II	Mean change
1	IOP (mmHg)	25.50 ±4.90	13.47±1.27	12.03	31.97±9.86	16.53±2.66	15.44
2	Visual acuity	0.78 ±0.28	0.75±0.31	0.03(NS)	0.62±0.31	0.85±0.24	-0.23(NS)
3	Pupil size (mm)	3.0 ±0.146	2.92±0.26	0.08 (NS)	3.04±0.23	2.99±0.11	0.05 (NS)

**Table 9. Patients on Treatment with Bimatoprost/Timolol Combination (Group A)**

Patient ID	Systolic Blood Pressure			Diastolic Blood Pressure			Pulse Rate (per minutes)		
	Base	Rev I	Rev II	Base	Rev I	Rev II	Base	Rev I	Rev II
B <sub>1</sub>	90	110	120	60	80	80	70	69	75
B <sub>2</sub>	130	130	120	80	80	80	80	71	71
B <sub>3</sub>	120	120	100	80	80	60	71	75	71
B <sub>4</sub>	130	110	120	80	80	80	79	69	69
B <sub>5</sub>	130	130	120	70	70	70	70	73	69
B <sub>6</sub>	140	140	130	80	80	70	79	71	69
B <sub>7</sub>	140	130	130	80	70	60	80	71	70
B <sub>8</sub>	120	120	120	80	80	70	79	72	72
B <sub>9</sub>	180	150	140	110	90	60	79	72	74
B <sub>10</sub>	130	150	140	90	80	80	74	72	73
B <sub>11</sub>	150	130	120	70	80	90	80	69	74

B <sub>12</sub>	120	120	120	80	80	80	70	78	72
B <sub>13</sub>	180	140	120	80	70	80	75	70	73
B <sub>14</sub>	140	140	120	90	70	80	74	71	71
B <sub>15</sub>	100	110	120	70	70	80	76	74	70
Mean	133.3	128.7	122.7	80.0	77.33	74.67	75.73	71.80	71.53
±STDE	±24.40	±13.56	±9.61	±11.34	±5.93	±9.15	±4.00	±2.45	±1.95
P- Value Vs Base Value by student t test			NS			NS			NS

NS- Non significant

**Table 10. Patients on Treatment with Travoprost / Timolol Combination (Group B)**

Patient ID	Systolic Blood Pressure			Diastolic Blood Pressure			Pulse Rate		
	Base	Rev I	Rev II	Base	Rev I	Rev II	Base	Rev I	Rev II
T <sub>1</sub>	160	140	130	80	80	80	75	78	76
T <sub>2</sub>	120	120	120	80	80	80	74	76	80
T <sub>3</sub>	120	120	120	80	80	80	76	71	72
T <sub>4</sub>	170	140	140	90	90	90	84	80	79
T <sub>5</sub>	120	120	120	90	80	80	70	75	76
T <sub>6</sub>	120	120	120	80	80	80	75	79	79
T <sub>7</sub>	120	120	120	80	80	80	76	80	70
T <sub>8</sub>	120	150	140	80	90	90	82	79	73
T <sub>9</sub>	110	110	110	70	80	80	69	70	67
T <sub>10</sub>	120	110	100	70	60	80	70	75	80
T <sub>11</sub>	130	130	130	70	70	70	67	69	73
T <sub>12</sub>	120	120	120	90	90	80	73	73	74
T <sub>13</sub>	120	120	120	80	60	80	76	79	73
T <sub>14</sub>	140	130	110	90	90	70	77	73	77
T <sub>15</sub>	140	140	110	90	90	70	72	75	76
Mean	128.7	126.0	120.7	81.33	80.0	79.33	74.40	75.47	75.00
±STDE	±16.85	±11.83	±11.00	±7.43	±10.00	±5.93	±4.59	±3.68	±3.78
P- Value Vs Base Value by student t test			NS			NS			NS

NS- Non significant

**Table 11. Mean ± SD Change of Blood Pressure and Pulse Rate In Groups A & B**

Blood pressure (mmHg)	Group A Bimatoprost/Timolol			Group B Travoprost/Timolol		
	Base	Review II	Mean change	Base	Review II	Mean change
Systolic pressure	133.3±24.40	122.7±9.61	10.6 (NS)	128.7±16.85	120.7±11.00	8 (NS)
Diastolic pressure	80.0±11.34	74.67±9.15	5.3(NS)	81.33±7.43	79.33±5.93	2 (NS)
Pulse rate	75.73±4.00	71.53±1.95	4.2(NS)	74.40±4.49	75.00±3.78	-0.06(NS)

**Table 12. Cost Details Of Bimatoprost/Timolol Combination And Travoprost/Timolol Combination**

Drug Combination	Drops per Bottle	Days per Bottle	Annual Usage (bottles per year)	Bottle Cost (Rs. per bottle)	Annual Cost	Monthly Cost	Cost per Day
Bimatoprost/ Timolol combination	60	30	12.1	Rs.491	Rs.5941.10	Rs.495.09	Rs.16.50
Travoprost/ Timolol combination	50	25	14.6	Rs.695	Rs.10147	Rs.845.58	Rs.28.16

**Table 13. Cost Effectiveness Analysis of Bimatoprost / Timolol Combination and Travoprost/Timolol Combination**

Drug combination	Annual cost	IOP reduction Lower value (mmHg)	IOP reduction Upper Value (mmHg)	Cost effectiveness range (Rs/mm Hg decrease in IOP)
Bimatoprost/timolol	Rs 5941.10	4	18.5	321.14 -1485.27
Travoprost/timolol	Rs 10147	4.5	30.25	335.43 – 2254.88

**Table 14. Patient Education form**

S. No	Questions	Before Patient education	After Patient education
1.	Do you know about glaucoma? Yes No	25(83%) 5(17%)	30(100%) 0
	If yes what is glaucoma It is an eye disorder It is an ear disorder It is an brain disorder I don't know	25(83%) 0 0 5(17%)	30(100%) 0 0 0
2.	Which part of eye getting affected during glaucoma? Optic nerves Eyelids Conjunctiva I don't know 333	13(43%) 0 17(57%) 0	28(93%) 0 2(6%) 0
3.	How did you come to know that you are suffering from glaucoma? During regular visit to the ophthalmologist for eye check up Gone to hospital for specific eye related problems Prompted by your relative that you are glaucoma Others	5(17%) 20(66%) 2(6%) 1(4%)	26(86%) 4(14) 0 0
4.	Did you know about the differences between cataracts and glaucoma? Yes No	14(47%) 16(53%)	27(90%) 3(10%)
5.	Is glaucoma hereditary? Yes No Can be	2(7%) 8(27%) 20(66%)	30(100%) 0 0
6.	What is I.O.P? Intra ocular pressure Intra cranial pressure Increased blood pressure I don't know	1(4%) 0 9(30%) 20(66%)	30(100%) 0 0 0
7.	What damage that can occur to your eye if the pressure is increased? Visual field loss Itching of the eye Dry eye I don't know	15(50%) 10(33%) 0 5(17%)	30(100%) 0 0 0

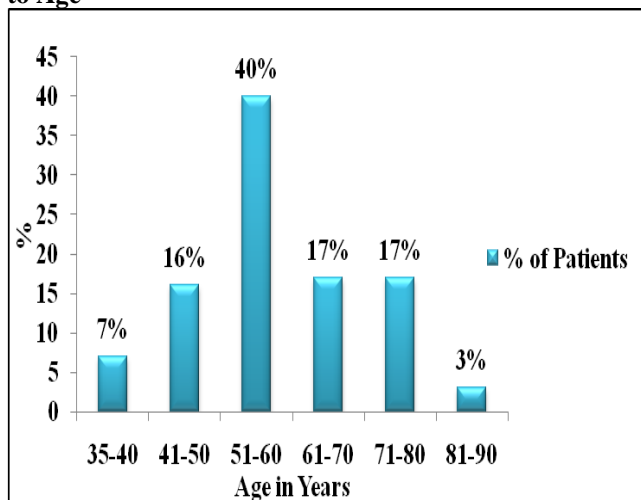


8.	Approximately how much money do you spend on glaucoma medication per month? Less than Rs 300 Rs 300 to Rs 500 Rs 500 to 800 More than Rs 800	0 10(33%) 8(27%) 12(40%)	0 10(33%) 8(27%) 12(40%)
9.	Did you know about glaucoma testing? Yes No	2(7%) 28(93%)	30(100%) 0
10.	Do you know how to use eye drops? Yes No If yes through Doctor Pharmacist Counselor Other Family members Pamphlet	15(50%) 15(50%) 20(66%) 9(30%) 0 0 0 1(4%)	30(100%) 0 20(66%) 9(30%) 0 0 0 1(4%)
11.	Where do you store medicine? Refrigerator At room temperature Others	5(17%) 25(83%) 0	0 30(100%) 0
12.	Are you following the treatment regularly? Yes No	27(90%) 3(10%)	30(100%) 0
13.	Did you aware about the risk and side effects associated with this treatment? Yes No	13(43%) 17(57%)	28(93%) 2(7%)
14.	Do you have faith on your treatment that the drugs would cure the diseases? Yes I have faith No I don't have But not fully No I need your alternative medicine	24(80%) 0 2(7%) 4(13%)	30(100%) 0 0 0
15.	Do you know how to open an eye drops medication bottle? Yes No	20(67%) 10(33%)	30(100%) 0
16.	Do you know how to apply an eye drops? Yes No	15(50%) 15(50%)	30(100%) 0
17.	Putting two drops would be more beneficial than one drop? Yes No	20(66%) 10(34%)	0 30(100%)
18.	Do you wash your hands before putting eye drops? Yes No	24(80%) 6(20%)	30(100%) 0

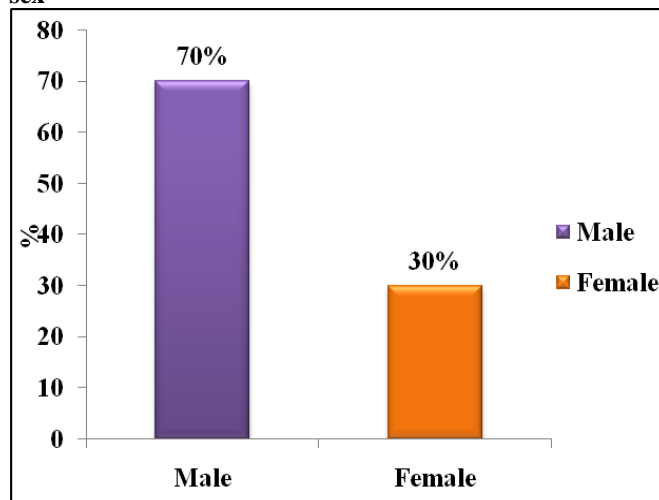
19.	Do you clean the dropper tip with hand after applying? Yes No	21(70%) 9(30%)	0 30(100%)
20.	If you miss an eye drop from its schedule? You will wait for next schedule You will instill at the earliest You will call your doctor You wont bother about it I don't know	10(33%) 8(27%) 2(7%) 10(33%) 0	28(93%) 0 0 2(7%) 0
21.	After applying the drop do you close eye for a minute Yes No	27(90%) 3(10%)	30(100%) 0
22.	How do you put two drops if they are prescribed to you? Put both drops together Put both drops one after other with a gap of 15 min Put drops in alternate days Don't put one of them	17(57%)  12(40%) 1(3%) 0	0  30(100%) 0 0
23.	Do you press the lower lid lightly with your finger for at least one minute after applying an eye drops? Yes No	15(50%) 15(50%)	27(90%) 3(10%)
24.	Have you ever read the medication insert along with eye drops? Yes No	7(23%) 23(77%)	25(83%) 5(17%)
25.	Anti – Glaucoma medication are used to Cure the disease Prevent the further damage Recover the vision damage caused by glaucoma I don't know	22(73%) 2(7%) 6(20%) 0	2(7%) 26(86%) 2(7%) 0
26.	Do you know that how long you have to take anti-glaucoma medication? For one year Only for two years Until the symptoms cured For life long	0 0 19(63%) 11(37%)	0 0 1(3%) 29(97%)
27.	Did you inform about the alternate /other therapy to the doctor? Yes No	14(47%) 16(53%)	24(80%) 6(20%)
28.	How frequently you will visit the hospital to consult your doctor? As per the doctor advice Yearly once Six months once Not bothered	20(67%) 5(16%) 3(10%) 2(7%)	20(67%) 9(30%) 1(3%) 0

29.	Do you check the expiry date while purchasing the medication? Yes No	23(77%) 7(23%)	30(100%) 0
30.	If you find any side effects while taking medication what will you do? I will inform to the doctor I will stop the medication I wont bother I don't know	16(53%) 8(27%) 0 6(20%)	23(77%) 7(23%) 0 0

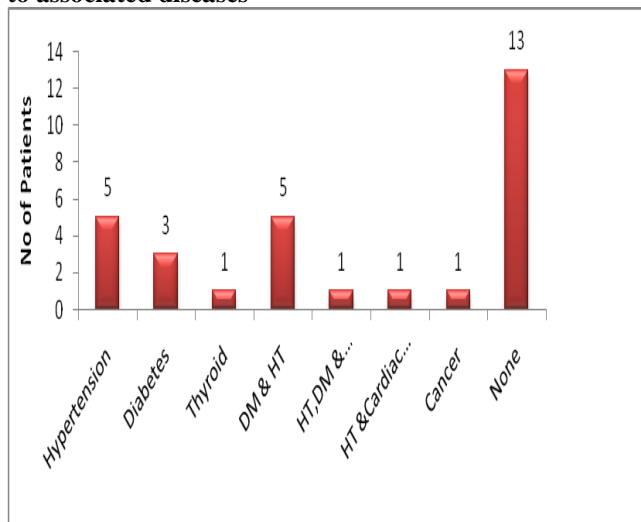
**Figure 1. Categorization of Patients (N= 30) according to Age**



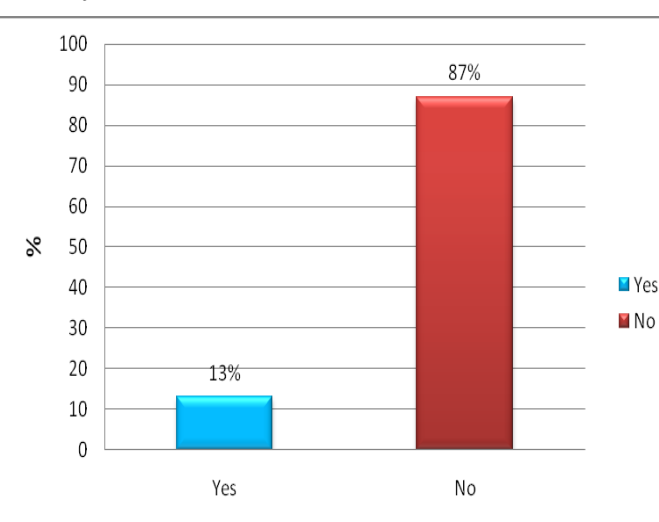
**Figure 2. Categorization of Patients (N=30) according to sex**

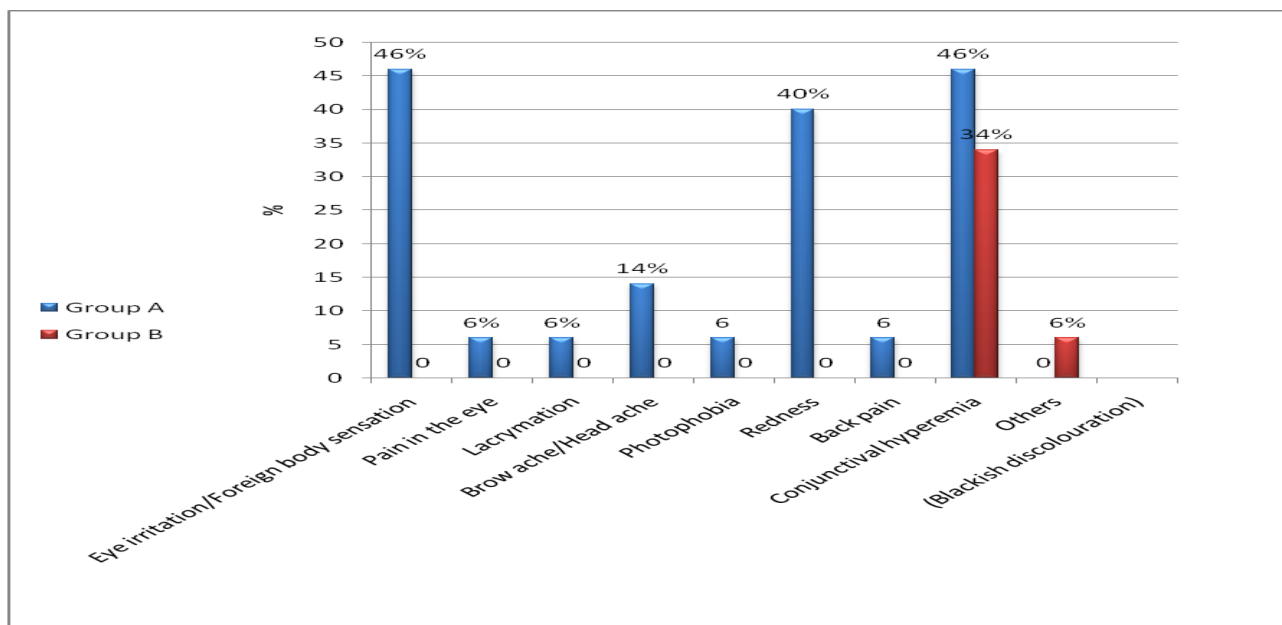
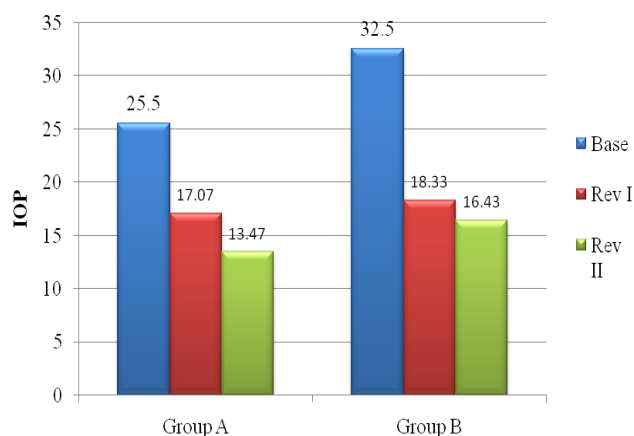
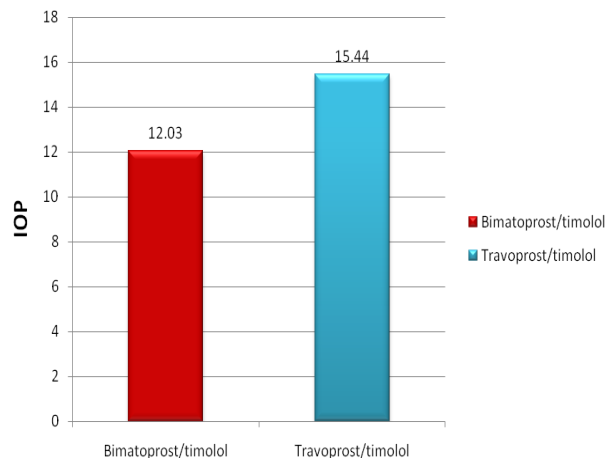


**Figure 3. Categorization of Patients (N=30) according to associated diseases**



**Figure 4. Categorization of Patients According To Family History of Patients With Glaucoma**



**Figure 5. Adverse Drug Reactions of Group A (Bimatoprost /Timolol) and Group B****Figure 6. Gradual Reduction of IOP during Two Months Of Treatment Between A & B****Figure 7. Mean Changes of IOP in Groups A & B**

## CONCLUSION

Studies on Glaucoma and the efficacy and safety of two drug combinations were conducted in a specialty Eye Care Hospital at Trichy. A total number of 30 patients were included and their details were collected using standard Proforma. The collected information was analyzed. IOP level is significantly reduced with Travoprost/Timolol combination that is higher than that with Bimatoprost/Timolol combination. Bimatoprost/Timolol combination and Travoprost/Timolol combination

does not have any effect on Visual acuity, Pupil size, Blood pressure and Pulse rate. From this study it is found that adverse drug reactions of Travoprost/Timolol combination were less than the Bimatoprost/Timolol combination. Further, the pharmacoeconomic study (cost effective analysis) revealed that Bimatoprost/Timolol combination is cost effective than Travoprost/Timolol combination. Due to the patient counselling, the patient's knowledge about glaucoma, its drug usage and patient compliance is improved.

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