



Assessments of Variations seen in intraocular pressure and its cost effectiveness of drugs used among patients diagnosed as Primary open angle glaucoma at tertiary care hospital

KEYWORDS

IOP (Intra ocular pressure), POAG (Primary open angle glaucoma), pharmaco-economic status in patients

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ABSTRACT

OBJECTIVE: The present study evaluated the variations seen in intraocular pressure and cost of therapy for primary open angle glaucoma.

METHOD: Proforma was designed factoring patients' demographical profile

RESULT: A total of 100 prescriptions of patients suffering from glaucoma were analyzed. Maximum cases (36%) belonged of age group 40 to 50 years with a gender ratio (Male/female) of 2.3. 82% had bilateral glaucoma. The patients aged more than 40 years had high intraocular pressure ranged 25-45 mm Hg. Total average cost of therapy per day per prescription was found to be Rs 7.52.

Conclusion: The present study showed high variation among patient suffering from primary open angle glaucoma. High average cost of therapy per day is matter of concern.

Introduction

Primary open-angle glaucoma is described as optic nerve damage from multiple possible causes that is chronic and progresses over time, with a loss of optic nerve fibers that is characteristic of the disease. In addition to the loss of optic nerve fibers, primary open-angle glaucoma is characterized by open anterior chamber angles, visual field abnormalities, and intraocular pressure that is too high for the continued health of the eye. Primary open-angle glaucoma exhibits cupping (depression) and atrophy of the optic disc (the front surface of the optic nerve, which is seen in the back of the eye), in the absence of other known causes of glaucomatous disease (1,2)

The prevalence of glaucoma is increasing worldwide, In India there are approximately 11.2 million persons aged 40 years and older with glaucoma. Primary open angle glaucoma (POAG) is estimated to affect about 6.48million. Globally an estimated 60.5 million people were (2.65% of the global population over 40) suffered from glaucoma in 2010. Of these an estimated 44.7 million had primary open angle glaucoma (POAG). The prevalence of glaucoma is expected to reach 79.6 million in 2020, impacting all countries although the largest increases are expected to be in china and India. This together will represent nearly 40% of case worldwide. Globally the number of people with POAG is estimated to reach 58.6 million by 2020, More than 4.5 million currently were bilaterally blind from POAG in 2010, a number that is forecasted to rise to 5.9 million by 2020(1,3).

Causes of raised intraocular pressure

Normally the aqueous humor plays an important role in nutrient delivery and waste disposal for the cells. It is produced by the ciliary body epithelium and drains out through the trabecular meshwork at the anterior chamber angle. When this flow is disrupted the pressure within the eye builds up (4, 5). This disruption can occur in two ways:-

- Blockage at the drainage at the trabecular meshwork (in open angle glaucoma)
- Narrowing of the angle of drainage (in angle closure glaucoma)

Materials & Methods:

1. This is a prospective study conducted in Out Patient Department of Ophthalmology, MGM Hospital, Kamothe, Navi Mumbai. In this study, Those Patients visited our OPD were included. Once the consultation by the ophthalmologist was over, the prescriptions were copied, and the patients were interviewed. The data includes name, age, sex, indications (diagnosis), drug name, and dose, route of administration, frequency and duration of treatment.
2. After noting down the required parameters prescriptions were returned to the patients and Data were analyzed for variation of IOP and cost of drug used in treatment of primary open angle glaucoma.
3. The study was conducted between sep 2011 to Aug 2012
4. Cost of the drug was taken from the CIMS, Indian pharmaceutical Guide and MGM pharmacy

Cost indicators:

In this study the following economic indicators were used

1. Average cost of drug used in OPD cases
2. Per day cost of individual drug

Observation and Results

In present study, 100 prescriptions of glaucoma patients have been analyzed, out of which 69% were male and 31% were female patients respectively. Maximum patients (54%) were in age group of 40 -60 yrs, out of, which 36% were male and 18% were female patient. (Table 1)

Table 1: Age and sex distribution of patients

Age	Male	Female	Total (%)
Below 20	4	0	4
20-40	22	10	32
40-60	36	18	54
60-80	7	3	10
Total(%)	69	31	100

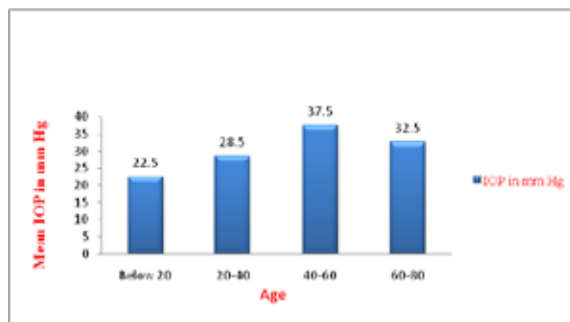
IOP Variation:

There is highest variation was seen in present study. High IOP were recorded in middle aged patient(40 -60 yrs) was 30.0 mm Hg to 45 mm Hg. Lowest IOP was recorded in below 20 yrs patients was 20.0 mm Hg to 25.0 mm Hg.(Table 1, fig 1)

Table 2: Shows variations in intra ocular pressure in different age group of POAG patients

Age	IOP in mm Hg
Below 20	20.0-25.0
20-40	22.0-35.0
40-60	30.0-45.0
60-80	25.0-40.0

Fig1: Graph shows mean no. variations in intra ocular pressure in different age group of POAG patients



Cost analysis

Beta-blocker was found to be cheaper than other anti-glaucoma drugs with lowest price for timolol (Rs 1.76/day), alpha2 agonist i.e brimonidine (Rs 4/day), carbonic anhydrase inhibitor i.e dorzolamide (Rs 12.48/day) , Prostaglandin analogue (Bimatoprost Rs 16.5/day and Latanoprost Rs 7.96/day) were found to be costliest among other group of drug available. The costliest drug prescribed was Bimatoprost. (, Fig 2)

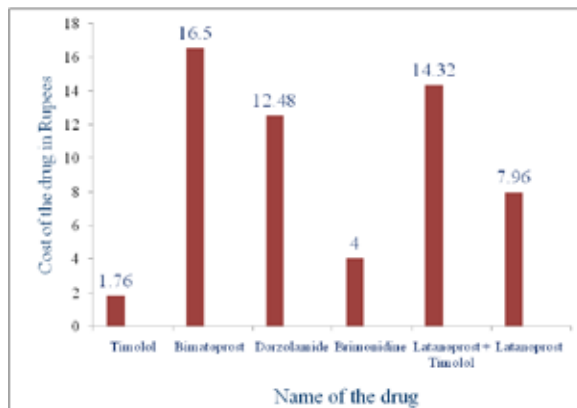


Fig 2: Graph shows Cost analysis of anti glaucoma drugs prescribed (Per day Cost)

Discussion

Glaucoma is an eye disease in which the optic nerve is damaged in a characteristic pattern. This can permanently damage vision in the affected eye(s) and lead to blindness if left untreated. It is normally associated with increased fluid pressure in the eye (aqueous humour). Wide variations in the prevalence of glaucoma were reported between the different studies. The prevalence of POAG increased with age in all the reported studies. The reported prevalence rates of glaucoma in an urban population were significantly higher as revealed in the Chennai Glaucoma study (CGS)(6) and the Andhra Pradesh Eye study (APEDS)(7). It is speculated that life style changes and cardio vascular disease patterns in urban India may indirectly influences the prevalence of POAG. Increasing age and higher IOP was a consistent risk factor for glaucoma in all the prevalence studies. Increased incidence of glaucoma with age is a cause for concern since India's population is ageing and the prevalence is expected to increase exponentially in the decades to come. A significant proportion of individuals with glaucoma will reside in the Indian subcontinent by 2030(8).

Glaucoma care has greatly changed during the recent past with the introduction of new medications and diagnostic technologies. The pharmacological strategies for the glaucoma treatment fall into two classes: reduction of aqueous humour secretion and enhancement of aqueous outflow. Five general groups of drugs, parasymphomimetics, carbonic anhydrase inhibitors (CAI's), α-agonists, β- blockers and Prostaglandin analogs have been found to be useful in the reduction of IOP.

Cost analysis:

Beta-blocker were found to be cheaper than other anti-glaucoma drugs with lowest price for Timolol (Rs 52.8/month). Prostaglandin analogue (Bimatoprost Rs 495/month and Latanoprost Rs 238.8/month) were found to be more costliest among other group of drug available, however Brimonidine (Rs 120/month) was less costlier than prostaglandin, followed by Dorzolamide (Rs 374.4/month)was also costly. Similar study was conducted by Rashmi Sharma et al Jammu(9). In that study, cost of different antiglaucoma drug was not similar to present study, the jammu study showed, cost of timolol (Rs14.39/month), Prostaglandin analogue (Rs 638.66/ month) and brimonidine were (Rs 266.70/month), Which showed more expensive cost than present study. In Jammu study, FDCs were not prescribed but present study showed cost of FDCs (Latanoprost).005%+ timolol 0.5%) were Rs 429.6/ month. High cost of timolol may be attributed to the favourable brand being prescribed. In addition, the cost difference in the study may also attributed to the date of the study. The Jammu study was conducted in 2004, this may attribute high cost observed in present study. Cost difference between timolol observed in the study is significant.

Conclusion

We conclude that, large number of variation seen among patient suffering from primary open angle glaucoma. Timolol being the first choice as it is cost-effective. Bimatoprost was most costliest drug prescribed. However, these findings cannot be generalized as prescribing preferences show regional differences. For glaucoma whatever therapy is chosen, the concept to be kept in mind is that glaucoma therapy is life-long and needs consideration of cost-effectiveness and convenience in individual patient.

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