



Cost variation analysis of antiglaucoma drugs available in Indian market.

Trupti Jadhao	Resident ,Department of Pharmacology ,LTMMC & GH,Mumbai
Manjari Advani	Associate Professor,Department of Pharmacology ,LTMMC & GH,Mumbai
Swapnil Jamdade	Department of Pharmacology,LTMMC & GH,Mumbai

ABSTRACT

Background: Glaucoma is the second leading cause of blindness worldwide. This study was aimed at comparing and analysing the costs of various brands of the same antiglaucoma drug, to study their cost variations.

Methods: The prices of 12 antiglaucoma drugs, available in 33 different formulations marketed in 47 brands & the prices of 6 fixed dose combinations available in 11 different formulations marketed in 12 brands were analysed. Cost ratio and cost variation were calculated.

Results: Highest cost ratio (1:11.37) and percent cost variation (1037.68) was found for Acetazolamide 250mg. This is followed by latanoprost 50 mcg x 1 mL x 2.5ml with cost variation (1:5.738) and percent cost variation (473.80) & Betaxolol 0.5%w/v x 5ml with cost ratio 4.16 and percent cost variation (316.06). In fixed dose combinations for antiglaucoma drugs, highest cost ratio (1:2.21) and percent cost variation (121.57) was found for Timolol 0.5% + latanoprost 0.005%, followed by Timolol 0.5% + Brimonidine 0.2 % [(1:1.6) and 60.60]. Highest number of brands of antiglaucoma drugs available in Indian market are for timolol 0.5% (31) followed by Acetazolamide 250mg (09) and Brimonidine 2mgxmx1x5ml (09). Highest number of brands of fixed dose combinations of antiglaucoma drugs available in Indian market are for Timolol + latanoprost (04) and Timolol + Dorzolamide (04).

Conclusions: This study shows that in Indian market, there is wide variation in the prices of different brands of acetazolamide (tablets), latanoprost & timolol (eye drops). So there is an urgent need to raise the awareness of physicians about cost variation to lower the financial burden on patients.

KEYWORDS

glaucoma, pharmacoeconomics, cost variation

INTRODUCTION

Introduction

Glaucoma is the second leading cause of blindness worldwide. The total cases of glaucoma in 2020 in India are expected to touch 16¹ million.¹ Treatment of glaucoma has a long course of duration and hence adherence to the treatment regimen is desirable.² Cost may be the deciding factor for adherence to medical therapy of glaucoma. For most diseases the drug cost represents only a part of total costs incurred by the patients. However for glaucoma, cost of medication is the major financial burden to the patient. Higher drug cost can lead to noncompliance which will lead to treatment failure³. This treatment failure ultimately results in higher medical care costs.

Glaucoma has received very little attention from health economists for the time being ⁴. In country like India where financial sources are limited, it becomes necessary to provide treatment of glaucoma in cost effective manner.

Creating awareness about Pharmacoeconomics can improve the chances of successful drug therapy. Very few studies are available in Indian scenario, which compare the cost of drugs of different brand of anti-glaucoma drugs.

This study was aimed at comparing and analysing the costs of various brands of the same antiglaucoma drug, so that we can study their cost variations. The knowledge of cost variations among antiglaucoma drugs can be applied to ensure more economical treatment regimen.

METHODS

The prices of 12 antiglaucoma drugs, available in 33 different formulations marketed in 47 brands were analysed .We also compared cost variation of 6 fixed dose combinations available in 11 different formulations marketed in 12 brands .

- Cost of a particular drug (cost per 10 tablets or per bottle), in the same strength and dosage forms being manufactured by different companies was obtained from "Current Index of Medical Specialties" (CIMS) September-December 2016, IDR December 2016 & Monthly index of medical specialties

(MIMS)December 2016.

- The cost ratio of different brands for each drug in the same dosage form and strength was calculated as follows :

$$\text{Cost ratio} = \frac{\text{Highest cost}}{\text{Lowest cost}}$$

- Percentage cost variation was calculated as follows;

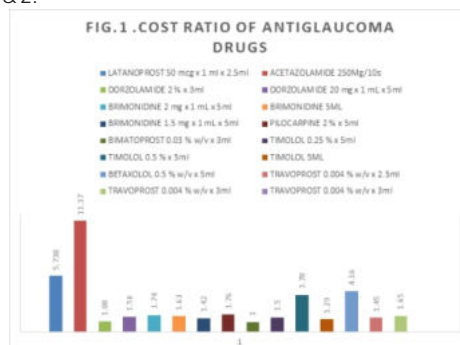
$$\text{Cost variation (\%)} = \frac{\text{Maximum cost} - \text{Minimum cost}}{\text{Minimum cost}} \times 100$$

From the above two ratio for each antiglaucoma drug, we can assess how many times more does the costliest brand cost, compared to the cheapest brand.

RESULTS

This study shows that in Indian market, there is wide variation in the prices of different brands of acetazolamide (tablets), latanoprost & timolol (eye drops).

Highest cost ratio (1:11.37) and percent cost variation (1037.68) was found for acetazolamide 250mg. This is followed by latanoprost 50 mcg x 1 mL x 2.5ml with cost variation (1:5.738) and percent cost variation (473.80) & Betaxolol 0.5%w/v x 5ml with cost ratio 4.16 and percent cost variation (316.06) as shown in fig. 1 & 2.

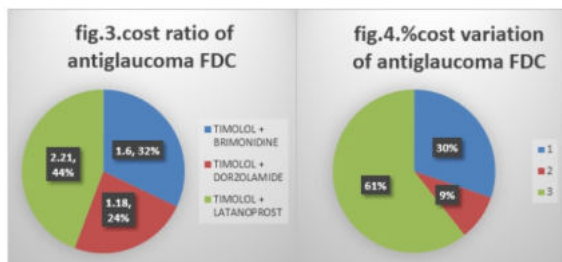
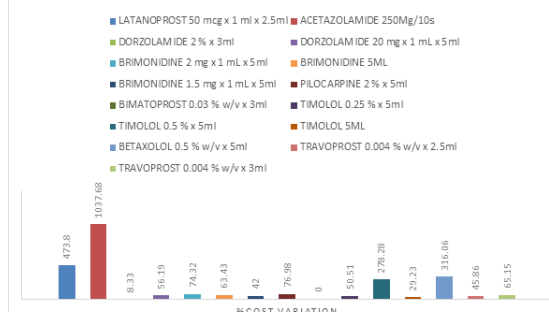


In fixed dose combinations for antiglaucoma drugs, highest cost ratio (1:2.21) and percent cost variation (121.57) was found for timolol 0.5% + latanoprost 0.005%, followed by timolol 0.5% + brimonidine 0.2% [(1:1.6) and 60.60] as shown in fig.3 & 4.

Highest number of brands of antiglaucoma drugs available in Indian market are timolol 0.5% (31) followed by Acetazolamide 250mg (09) and Brimonidine 2mg x1ml x5ml (09). Highest number of brands of fixed dose combinations of antiglaucoma drugs available in Indian market are for Timolol + Latanoprost (04) and Timolol + Dorzolamide (04).

While analysing we observed that there were some preparations of antiglaucoma drugs in particular strength which were manufactured by only one company and were excluded from the cost variation analysis.

FIG.2.COST VARIATION IN ANTIGLAUCOMA DRUGS



DISCUSSION

Pharmacoeconomics plays an important role in practice of medicine in developing countries and also constitutes an essential part of rational drug prescription. Pharmaceutical Industry has many branded formulation of the same drug with large difference in selling price. In India, most of the drugs are available in brands and according to prescribing pattern studies, prescribing with brand name is practiced⁵. This may affect the patient's finance adversely if costly brand is prescribed specially in chronic diseases like glaucoma. If generics are prescribed and pharmacists are counselled, patient may have option of selecting the brand suitable to their budget.

While analysing we observed that tablet acetazolamide had maximum cost variation followed by latanoprost and Betaxolol eye drops. The cost of drugs included in National list of essential medicines (NLEM) is regulated by Drug price control order 2013.⁶ It is notable that acetazolamide 250mg which is included in NLEM 2015 also demonstrate extensive cost variation. The ceiling price of acetazolamide 250 mg as per National pharmaceutical price control authority is 3.26Rs/tablet whereas in our study we observed it to be 7.85Rs/tablet.

Observing the cost variation one question comes to mind is whether the quality of cheaper medications is equivalent to that of its more expensive brand. However, cheaper brand drugs also undergo same rigorous standards of production and control. Hence, the factors which attribute to the retail price of prescription medication include employee wages and benefits, facility costs (rent/mortgage, property insurance, and taxes), and prescription

department operating costs (license fees, liability insurance). These expenses are influenced by geographical location and current local market conditions and this provides one explanation regarding medication cost variability.

The systematic review done by Allan et al regarding physicians awareness about drug cost showed that the Pharmacoeconomics awareness among doctors results in decreased overall drug expenditures⁷. Another clinical trial by Franzier LM et al showed that Availability of drug manual with comparative drug prices among doctors played an important role in circumventing the lack of awareness about cost variations. This will play an important role in reducing patient's drug expense.⁸ we also recommend that generic drug prescribing by doctors and counselling of Pharmacist to dispense affordable medicine to patient could reduce the financial burden on the patients.

However, our study does not address issues of efficacy, tolerability, or patient safety assuming that the manufacturers are following GMP guidelines. Antioxidants are prescribed now a days for treatment of glaucoma. However, there is no strong evidence suggestive of beneficial effect of dietary antioxidant intake and its neuroprotective effect on POAG.⁹ But these are being prescribed their cost also adds to the treatment. Their cost variation is not taken into consideration in our study as their role is questionable.

As newer medications and treatment schemes are introduced, future studies will be needed to update the rapidly changing economic information pertaining to the medical management of glaucoma.¹⁰

DECLARATIONS

Funding: No funding required

Conflict of interest: none

Ethical approval: Not required

REFERENCES

1. Quigley, H A. "The Number Of People With Glaucoma Worldwide In 2010 And 2020". British Journal of Ophthalmology 90.3 (2006): 262-267.
2. Higginbotham, . " Considerations In Glaucoma Therapy: Fixed Combinations Versus Their Component Medications". Clinical Ophthalmology (2009): 1.
3. Shrank, William H. et al. "The Implications Of Choice". Archives of Internal Medicine 166.3(2006): 332.
4. Kobelt, Gisela. "Health Economics, Economic Evaluation, And Glaucoma". Journal of Glaucoma 11.6(2002): 531-539.
5. QuaziShahir Ahmed, KausarSayed et al. "Drug utilization study of antiglaucoma drugs in tertiary care teaching hospital, bareilly". World Journal of Pharmaceutical Research 3.2(2014).
6. National list of essential medicines 2015. Available from: <http://www.drugscontrol.org/pdf/NLEM-2015.pdf>. Accessed on 22 July 2016.
7. Allan GM, Lexchin J, et al. Physician awareness of drug cost: a systematic review. PLOS Med. 2007;4(9):283.
8. Frazier LM, Brown JT, Divine GW, Fleming GR, Philips NM, Siegal WC, et al. Can physician education lower the cost of prescription drugs? A prospective, controlled trial. Ann Intern Med. 1991;115(2):116-21.
9. Shukla AK, Mehani R et al. Cost analysis of antiepileptic drugs available in India. Int J Basic Clin Pharmacol. 2016;5:1636-40.
10. Shukla AK, Sharma P. Cost variation study of antidepressant drugs. Int J Basic Clin Pharmacol. doi:10.18203/2319-2003.
11. Rylander, Nathan R. and Steven D. Vold. "Cost Analysis Of Glaucoma Medications". American Journal of Ophthalmology 145.1 (2008): 106-113.