



ORIGINAL RESEARCH PAPER

Management

PRESERVATIVE FREE EYE DROPS-A CURRENT TREND IN OPHTHALMIC MARKET

KEY WORDS: Preservative Free Eye Drops, Ophthalmic Market

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ABSTRACT

This project explains facts & figures about Preservative Free Eye drops & trends shaping the market and their Impact on Ophthalmic Market. Key part of study exposes Prevalence of Ophthalmic diseases & frequently Prescribing molecules which comes in daily practice of ophthalmologist. Through Primary Research, this project reflects the various touch points & Persuasion of Ophthalmologist, Patient & Retailer basically consumer behavior of Ophthalmologist in prescribing, Patients in buying & Retailers in promoting Preservative free Eye Drops.

INTRODUCTION

As per the report of Market Scope it forecasts that India's ophthalmic market is US\$1.3 billion and expected to grow at a compound annual growth rate (CAGR) of 6.8 percent to \$US1.8 billion by 2022.

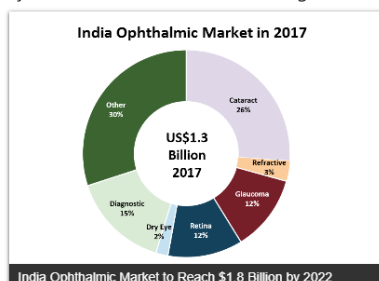
Also report shows Break up of diseases as follows Cataract-26%, Diagnostic-15%, Glaucoma & Retina-12%.

India is consider as one of the vast growing economy in the world. The country encloses of 18 percent of the total population globally and approximately 30 percent of the total global blind population. About half of them, blind majorly from Cataracts also Glaucoma & Retinal diseases. In terms of treatments for diseases, the largest market is occupied by cataract surgical product & diagnostic equipment followed by retinal and glaucoma. In India revenue from cataract surgery is expected nearly a quarter of total ophthalmic market revenues in the country.

Second largest ophthalmic market in India is diagnostic equipment which is expected \$257 million nearby in 2022. Also growth of 4.8 percent emerging as trend in terms of Technological Advancement in Hospitals, Telemedicine, Automate Medical Records as well which fetches the opportunity for the companies to enter into the new market.

The third largest ophthalmic sub-market in India is Glaucoma. Report of Market Scope forecasted that India's glaucoma market will rise to US\$271.8 million by 2022 at a CAGR of approximately 11 percent.

Acc to report of Amritt-a global business consultants, it is being recorded that around 15,000 ophthalmologists practicing in India, Indian ophthalmologists perform 5 million cataract surgeries annually of which 90 percent included intraocular lens implantation. Around 12 million Indian population suffers from glaucoma. India has approximately 10 million blind citizens and 2 million are added every year. Approx. 60% of cases of blindness are caused by cataract and about 13% from glaucoma.



Amritt report also shows Ophthalmic Services across India majorly operated by Government, Corporations and Non-Profit Organizations.

Most extrusive Ophthalmic Hospitals in India are as follows-

HOSPITAL	AREA
Aravind Eye Hospital	South India
Shroff Eye Centre	Delhi
L.V. Prasad Eye Institute	Hyderabad
Dr. Daljit Singh Eye Hospital	Amritsar
Sankar Netralaya	Chennai

LITERATURE REVIEW

The Eye is considered as most sensitive as well as the lamp of our body which needs special care. Nowadays Ophthalmologists seeking to provide a quality products with higher benefits made their role crucial while delivering the services. Owing to the convenience to patient and affordability, ophthalmologists are frequently prescribing Preservative free eye drops. It has been notified that after installing the eye drops few medications leads to a blurry vision for a moment which brings the attention towards dosage form, ophthalmologists concern about it either the eye drops are in a gel form or ointment form. Majority of eye drops contain preservatives that inhibit microbial growth and makes them safe & efficacious to install. Preservatives in the Eye drops causes irritation, redness and dryness sometimes in patients rather than soothing effects. Studies shows that glaucoma patients suffered from OSD (ocular surface disease) symptoms after administer of eye drops containing preservatives so they shifted towards Preservative free eye drops. The sample size considered was 339 glaucoma patients engage in 2 Phase IIIb trials. Patients shows sign & symptoms of OSD at baseline & a period of 6 months installed eye drops containing preservative benzalkonium chloride. All patients switched from eye drops with BAC to preservative-free eye drops recorded a period of 12 weeks. The incidence observed with preservative at baseline like dry eye sensation, stinging, irritation, burning, itching, tearing-dilute to one-third with preservative free eye drops after consuming 12 weeks. The severity of conjunctival hyperemia reduced to halved after treating with preservative-free eye drops. A drastic conclusion have been made Intraocular pressure remain unchanged even after displacement of eye drops with preservative BAC with preservative-free eye drops. Also Preservative free eye drops relief in ocular surface disease & leads to change preferences in terms of treatment. Till the end it is summarized that 72% patients are in favor of preservative-free eye drops over preservative containing one.

Many ophthalmologists suggested to use preservative-free eye drops to avoid these problems as several studies shows that eye drops containing preservative leads to dry eye symptoms. In many instances non-preservative eye drops comes in a unit-dose tubes or Ampules once they're opened, they should be used up or thrown away. It must be disposed of after 24 hours once they are torned. If these eye drops are exposed to the environment and stored for too long, it will cause micro-organisms to grow in the solution. Some artificial tears contain electrolytes, these additives promote healing of the surface of the eyes. Also artificial tears also contain

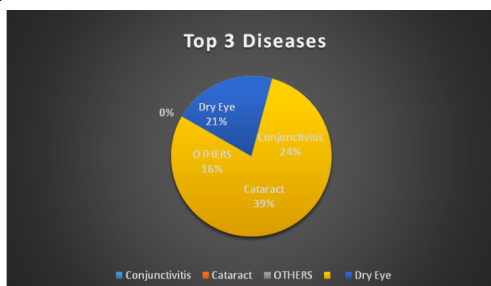
thickening agents, which keeps the solution on the surface of eyes longer. Benzalkonium chloride (BAK or BAC) is considered as most toxic preservative used nowadays because of its tremendous preservative action. The complication is that it's just as good at killing corneal cells as it is at killing bugs where as the milder preservatives shows adverse effects in some degree here comes need of product with a safety margin. As the preservative free eye drops are proven safe and effective clinically doctors can prescribe freely. The various companies have adopted skimming strategy to enter into the ophthalmic market as products already have deep root inside. These parameters clearly indicate that Ophthalmic market has enormous potential as the customers are also in favor of Preservative free eye drops. From the druggist/Retailers end it is concluded that certain factors like Storage condition, dosage form, packaging is a matter of concern for preservative free eye drops. According to them it's like water surrounds the Lotus Flower but doesn't wet its petals i.e. new market takes a time to grow still the product is in the introductory phase. When a patient comes with symptoms like irritation, grittiness, burning sensation, soreness, watery eyes & visual disturbances generally affecting the eyes, a record with detailed history should be maintained by the pharmacist because it may elicit information about contributing factors. Pharmacy is a frequent point of contact for patients whenever Patients experiencing any symptoms pharmacist can advice on management. Some doctors leave the choices for the patients also enlist the preservatives not to use, in that case Patients generally approach toward the brands based on performance, availability and price. Ultimately the company's must have patient centric approach to provide better Health-care services at affordable price.

DATA COLLECTION AND ANALYSIS

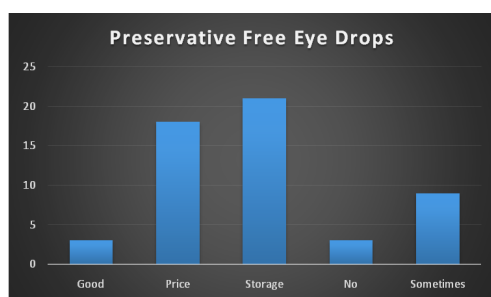
The Research design is a catalogue of the various phases and the facts related to the formulation of a research effort. In this project, data was collected by using more no of methods like from official websites, Questionnaire, Observation and direct Interviewing. Initial phase of study comprises of gathering of information from various search engines & government base databases (surveys & cohort studies) in order to understand the Market, current Trends, Diseases, Molecules existed. Later Primary research was conducted through observation, direct communication and survey, sample size was taken 150, which includes 50 ophthalmologists, 50 Retailers and 50 patients. After that data has been observed, based on that analysis has been made.

RESEARCH QUESTIONS

Doctors- What are the most prominent diseases occurring in Eyes?

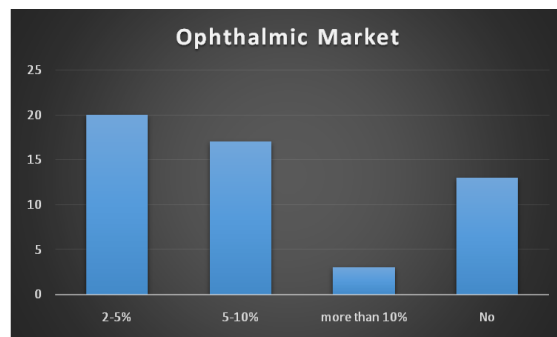


Doctors - What is your opinion about preservative free eye drops that are available on the market?



Graph-2

Retailers- Do you think market is ready for advanced dispensing devices (preservative free) for Eye drops?



Graph-3

RESULTS & FINDINGS

As per the doctor's notion prevalence of Cataract, Allergic conjunctivitis & Dry eye diseases occurs the most & these diseases are independent of seasonality, Whereas from the Patients desk Allergic conjunctivitis, Dry eye & Refractive error came into flash. The most handy Active Ingredients which don't let the doctors pen down are Carboxymethylcellulose, Combination of Polyethylene glycol & Propylene glycol (dry eye), Olopatadine HCL because of history, safety & unbeatable trust by ingredients & companies. From the opinion of Retailers ingredients like Carboxymethylcellulose, Polyethylene glycol & Carmellose sodium came into picture. After direct interviewed the doctors it is reflected that 91% doctors are willing to Prescribe & 66% Retailers showed interest in Preservative free eye drops.

- GAP existed between top 3 Molecules**
- By applying the interval scale it is concluded
 $R = \text{Rank1} * 5 + \text{Rank2} * 3 + \text{Rank3} * 2$
 - PEG/PG = $17 * 5 + 23 * 3 + 7 * 2 = 168$
 - CMC = $17 * 5 + 8 * 3 + 11 * 2 = 131$
 - Olopatadine = $5 * 5 + 8 * 3 + 11 * 2 = 56$
- Comparison between top 3 Molecules**
 - PEG/PG & CMC = $168 - 131 = 37$
 - CMC & Olopatadine = $131 - 56 = 75$
 - PEG/PF & Olopatadine = $168 - 56 = 112$

OBSERVATION

From graph 2 it is concluded that Medical Professionals & ophthalmologists agreed that it is better to use preservative free eye drops whenever possible because of safety and storage concern. It reveals the advance technique to store preservative free eye drops through multi-dose ophthalmic squeeze dispenser.

From graph 3 it is observed that as per the demand product value increases and product is having more benefits in terms of quality concern at a reasonable price these parameters indicate the priority of Retailers toward the market.

From the market Gap has been analyzed individually of existed molecules whereas gap between these molecules fetches the competition in the Market.

CONCLUSION

A new Trend in Market has been observed various companies implemented their strategies to enter & sustain in the market. Ophthalmic market is ready for new dispensing device i.e. preservative free eye drops. Also Medications are already prescribing and have futuristic requirement for common diseases. It is concluded that 91% doctors are willing to Prescribe & 66% Retailers are in favor of Preservative free eye drops, Huge opportunity with enormous potential is awaiting.

References

1. <https://market-scope.com/pressrelease/india-ophthalmic-market-forecast-to-reach-1-8-billion-by-2022/>
2. <https://www.ncbi.nlm.nih.gov/pubmed/27041987>
3. <http://www.amritt.com/industries/medical-device-india/ophthalmic-devices/>
4. <https://www.glaucoma.org/treatment/preservative-free-glaucoma-medications.php>
5. Rosin LM, Bell NP. Preservative toxicity in glaucoma medication: clinical evaluation of benzalkonium chloride-free 0.5% timolol eye drops. Clin Ophthalmol. 2013;7:2131-2135.
6. <https://www.dovepress.com/preservative-toxicity-in-glaucoma-medication-clinical-evaluation-of-be-peer-reviewed-article-OPHTH>
7. <http://www.allaboutvision.com/eye-exam/refraction.htm>