

## REVIEW ARTICLE

# Pharmaceutical ophthalmic market perspectives in India and emerging trends

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**Abstract**

Ophthalmic pharmaceutical markets are expanding and growing globally and in India. This review article gives a glimpse of the current pharmaceutical market globally and compares the international ophthalmic drug markets with the scenario in India with further insights into the relative contribution and growth from individual ophthalmic therapy segments as well as a look at future ophthalmic drug pipeline.

**India's Growing Presence in the Global Pharmaceutical Market**

By 2020, the global pharmaceutical market is anticipated to more than double to US\$1.3 trillion at a 5% compound annual growth rate (CAGR), with the E7 countries - Brazil, China, India, Indonesia, Mexico, Russia, and Turkey accounting for around one-fifth of global pharmaceutical sales.<sup>[1,2]</sup> India is likely to be among the top three pharmaceutical markets by incremental growth and sixth largest market globally in absolute size.<sup>[3,4]</sup> In March 2018, the pharmaceutical market grew at 9.5% year on year with sales of Rs. 10,029 crore (US\$ 1.56 billion). While India ranks tenth globally in terms of value, it is ranked third in volumes. Increase in the number of middle-class households, advance in medical infrastructure, and increase in the penetration of health insurance in the country will play a role in influencing this growth. During the period of April 2017–February 2018, India exported pharmaceutical products worth Rs. 767.17 billion (US\$ 11.90 billion) with this number expected to reach US\$ 40 billion by 2020. Indian drugs are exported to >200 countries in the world, with the US as the key market, followed by Europe, Africa, and other Asian countries. India is the world's largest provider of generic medicines; the country's generic drugs account for 70–80% of the domestic retail market and 20% of global generic drug exports in terms of volumes.

**Overview of Ophthalmic Markets**

The global ophthalmology market is dominated by ophthalmic devices and equipment which make up almost US\$ 47 billion. 25% of this market is contributed by surgical devices. India's current ophthalmic market is about US\$ 1.3 billion expected to grow at a CAGR of 5–6.8% against a global growth of 4.06%.<sup>[5]</sup> The largest submarkets in terms of revenue in India are cataract surgery and diagnostic equipment, followed by dry eye and glaucoma, the latter two leading the ophthalmic drug market. In 2017, alone 7.1 million cataract procedures took place, with revenues expected to generate more than a quarter of the total ophthalmic market revenues in the country.<sup>[6,7]</sup> The diagnostic equipment market is the second largest ophthalmic market in India and is expected to reach nearly \$257 million in 2022. The glaucoma segment is the fastest growing ophthalmic pharmaceutical submarket in India and is expected to be a US\$271.8 million market by 2022 at a CAGR of approximately 11%.

**The Pharmaceutical Ophthalmic Market**

This constitutes the ophthalmic therapeutic drug market. Global ophthalmic drugs market size was valued at almost \$30 billion, in 2016, and is expected to reach \$42 billion by 2023, registering

a CAGR of 5.3% from 2017 to 2023.<sup>[8]</sup> 35% contribution comes from North America partly due to increase in geriatric population there. Ophthalmic drug's drivers globally include those used to treat glaucoma, cataract, and retinal conditions: ARMD and diabetic retinopathy.

The retina and glaucoma market dominate the therapeutic global ophthalmology market with almost a 20% share each, while dry eye prescription market is under 5% with a higher component of OTC sale. According to the American Academy of Ophthalmology, 11 million people in the U.S. suffer from age-related macular degeneration (AMD), while approximately 10% of them have wet AMD. Retinal disorders indication has registered significant growth rate, (CAGR of 5.8% from 2017 to 2023) with dry AMD segment accounting for the highest share among all the retinal disorders in 2016.<sup>[8]</sup> There is a high prevalence of glaucoma worldwide and rise in transition toward the development of combination therapies for the treatment of glaucoma. Such trends are contributing to the growth of the global retina market. Increase in investment by market players in emerging economies offers lucrative opportunities for market growth in near future.<sup>[8]</sup>

Introduction of novel ocular drug delivery is currently the global focus. Multicompartment drug delivery systems registered the highest CAGR of 8.0% with increase in the development of novel ocular drug delivery approaches including nanoparticles, noisome, and dendrimers.<sup>[8]</sup>

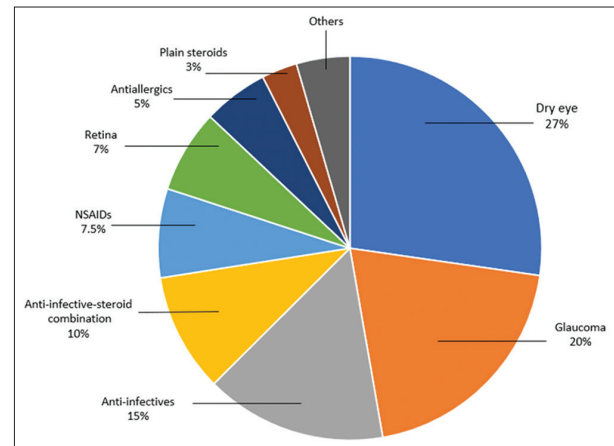
In India, the pharmaceutical ophthalmic market has grown from around 1400 crores INR in 2014 to 2200 crores INR in 2018. Currently, this market is growing at a rate of 6.4% (2018).<sup>[9]</sup>

Glaucoma and tear substitutes (for dry eye) lead the pharmaceutical market in India (Figures 1 and 2 show the relative breakup of the Indian ophthalmic drug market subsegments and their current growth, respectively).

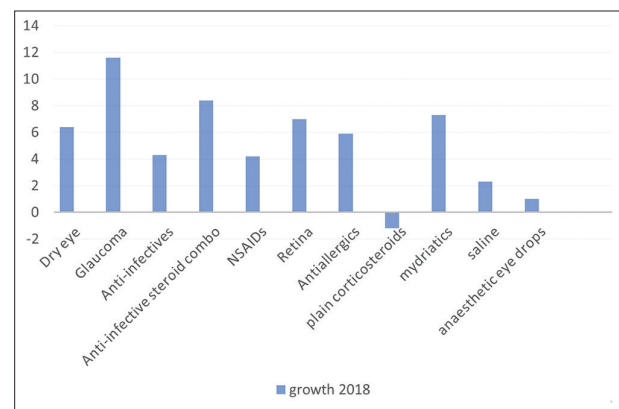
By market share, the dry eye segment is the largest with methyl cellulose-based (carboxymethyl cellulose and hydroxypropyl methylcellulose) tear substitutes and lubricants forming the bulk of this market along with other polyethylene glycol and polyvinyl alcohol-based tear substitutes. Around 3–4% contribution comes from topical cyclosporine, around 2% from hyaluronic acid-based lubricating drops and <1% from topical rebamipide and Vitamin A. Branded generics constitute around two-third of this market with overall almost 200 brands.

The glaucoma segment is the fastest growing subsegment in the ophthalmic pharmaceutical market. Value wise more than one-third of this market is with prostaglandin analogs, with almost 25% of the glaucoma market value constituted by innovator branded prostaglandin analogs. Another one-third of the market is with fixed-dose combinations, with brimonidine-timolol combination taking up 20% of the overall glaucoma market value. The rest is distributed evenly among beta-blockers, alpha-agonists, and carbonic anhydrase inhibitors. Overall, around 45% of market is with innovator brands, which is the highest for any ophthalmic submarket and the rest with branded generics. The glaucoma market breaks up in India closely mirrors global glaucoma market trends.

The anti-infectives and their combinations with corticosteroids form one-fourth of the ophthalmic pharmaceutical market, which



**Figure 1:** Percentage market share of ophthalmic drug segments in Indian market (2018)



**Figure 2:** Percentage growth of ophthalmic subsegments in India

consists predominantly of branded generics with a significant prescription contribution from physicians as well. Currently, moxifloxacin (45%), nepafenac (51%), and olopatadine (38%) are the key player in the anti-infective, nonsteroidal anti-inflammatory drugs, and antiallergic ophthalmic drugs submarkets, respectively. Among the plain steroids, loteprednol, fluorometholone, and prednisolone constitute 90% of this relatively small submarket with loteprednol representing the growing market. The retina market is currently dominated by various antioxidant combination supplements which constitute almost 90% of the retina pharmaceutical submarket, with monoclonal antibodies taking up the rest with a minor contribution from formulations like silicon oil. The other small submarkets (1% each) include saline/salts, mydriatics, and anesthetic drops, and other herbal preparations.<sup>[9]</sup>

## Future Prospects

More than three-fourths of the ophthalmic drug market are with branded generics and this generic market will continue to expand in every subsegment in sync. with expected growth of the overall

ophthalmic pharmaceutical Indian market. The eye drop segment of tear substitutes, anti-infectives with and without steroids, and saline/salt preparations has a considerable component of OTC sale. Three ophthalmic segments are poised for introduction of innovator brands in the near future. Dry eye segment may show the entry of drugs such as lifitegrast, lacritin, nasal tear stimulators, and sodium channel blockers as well as improvement in formulation technology with nanomicellar formulations, mucus penetration particle technology, and addressing meibomian gland dysfunction.<sup>[10-16]</sup> Glaucoma segment has already shown two new USFDA approvals in Rho kinase inhibitors and latanoprostene bunod, with a third trabodendoson (adenosine A1 agonist) being reevaluated.<sup>[17-19]</sup> The retina segment is likely to show DARPins (ankyrin derivatives), non-biodegradable long-term fluocinolone-eluting implants, antiplatelet-derived growth factors, and number of monoclonal antibody drugs in development.<sup>[20-22]</sup>

This overview gives a glimpse of the current structure and growth trend of the ophthalmic pharmaceutical market in India along with future prospects and development of innovative new drugs, as well as innovations in formulations and delivery technology.

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