Generic Versus Branded Glaucoma Drugs

Generic medications offer therapeutic benefits for some patients.

BY MARCOS REYES, MD, AND LAUREN WIGGINS, MD

Glaucoma is the second leading cause of irreversible blindness in the world. More than 3 million US citizens suffer from the disease, and only half know they have it.[1] The economic impact is significant, given that glaucoma accounts for over 10 million visits to physicians each year.[2] In terms of direct medical costs and lost productivity, the cost to the US economy is estimated to be $2.86 billion annually.[3] The cost of IOP-lowering eye drops incurred by patients is part of that equation and can be a significant monthly strain on their budgets. Although patients may report adherence to daily medical therapy, data reveal less than 50% annual persistence in usage.[4] The introduction of generic glaucoma eye drops into the marketplace has reduced costs for patients and improved adherence in some patient groups,[5] but it has also raised concerns regarding equivalence in efficacy and side effect profile.

COST

It is estimated nationally that prostaglandin analogues can cost a patient more than $100 out of pocket monthly. In 2011, when the first generic prostaglandin analogue was released, it was estimated that patients who switched to the generic form saved more than $1,300 per year.[5] According to recent data on www.GoodRx.com, where we practice in mid-Missouri, a 30-day prescription for generic latanoprost costs between $19 and $30, whereas the same prescription for Xalatan (latanoprost ophthalmic solution; Pfizer) prices from $139 to $154.

Similar trends exist for all generic versions of branded medications. Given these differences in cost, it is no surprise that generic drugs make up 80% of the market share.[5] Prescription savings plans and coupons are available for some brand-name medications, but unfortunately, patients with Medicaid and Medicare cannot participate in these programs. In mid-Missouri, this excludes up to two-thirds of patients in a typical practice.

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BIOEQUIVALENCE AND EFFICACY DIFFERENCES

For systemic medications, generic bioequivalence is proven by showing similar absorption properties for both speed and amount in the bloodstream compared to the original drug.[6] Ophthalmic bioequivalence absorption is not possible to measure, so generic drugs are required to be an exact copy of the ingredients of the original drug, including both the active ingredients and excipients. If the excipients differ by more than 5% from the original drug, an in vivo clinical endpoint bioequivalence study is requested by the FDA.[7,8] At no point, however, is evidence of clinical therapeutic equivalence required.

Despite the requirements on generics, there are compositional differences between generic and brand-name drugs. In 2012, Kahook et al showed that exposure to temperatures at high ends of the labeled value led to a significant decrease in the concentration of active ingredients in generic formulations. Specifically, they found that two different generic formulations of latanoprost lost greater than 10% of the mean active ingredient concentration at temperatures at the higher end of the labeled indication (50ºC). They also found that generic formulations had a higher number of particulate contaminates over 1 µm than their brand-name counterparts.[9]

Other differences are the bottle's material, shape, and size. Our patients have demonstrated to me the

difficulties they have consistently administering drops with some generic bottles. For some, the shape of the bottle poses a problem; for others, the rigidity of the bottle makes it difficult for arthritic fingers to squeeze.

Delivery doses (drop size) of generic bottles can vary from 25 to 75 uL per drop. That is a possible 300% variation in drop size. Additionally, pH can vary widely as well, with generic drops having a higher pH on average. Our own patients express frustration about the varying generic versions of their medication over the calendar year, as their local pharmacy adjusts their wholesale purchases.

Together, all of these factors influence clinical efficacy. A 2007 study published in the *Indian Journal of Ophthalmology* showed that Xalatan reduced IOP by 37% on average, whereas generic latanoprost reduced IOP by about 25%.[10]

ADHERENCE

Glaucoma medications are only effective when they are used consistently and administered properly. In general, generic eye drops are believed to increase adherence because the medications are more affordable. Switching to a generic medication was found to significantly improve compliance among African American patients.[4] This is important, considering that African-Americans were generally high-risk glaucoma patients with low rates of adherence prior to the introduction of a generic prostaglandin.[5] Conversely, our experience has been that some formulations of generic timolol are associated with a higher incidence of stinging and blurred vision, which can reduce adherence.

CONCLUSION

Generic glaucoma medications are not comparable to their brand-name counterparts, but they can still be therapeutically effective in many instances. It is beneficial to prescribe generic drops to manage costs and improve adherence. When doing so, however, physicians must monitor IOP more closely, given the agents' potential for reduced efficacy. Clinicians must also educate patients about the differences between generic and brand-name drugs. According to an unpublished study by Paul Singh, MD (2014), after educating 20 patients about the differences between generic and branded glaucoma drugs, 13 patients switched from generic to brand-name medications of their own accord.

We recommend switching a patient from a generic to a brand-name medication if his or her therapeutic endpoints are not maintained or if the expected IOP reduction is not reached. If a patient benefits from brand-name therapy, we try to manage costs with manufacturer prescription savings plans. As with all things in medicine, the partnership, open education, and discussion between the physician and patient are essential to achieving the desired outcome or, at the very least, the best situation possible. ■

WATCH IT NOW

For more on his study, watch the interview with Dr. Singh at http://eyetube.net/?v=iguge.

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