

New Trends in the Medical Management of Glaucoma

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Introduction: Glaucoma management is continuously evolving to safer more effective and less invasive modalities. Topical anti-glaucoma medications are still the first line therapy in glaucoma management.¹ Recently there has been a lot of research into novel drugs, delivery systems and medications with better preservatives. A few years ago, available therapeutic options mainly increased uveo-scleral outflow or decreased aqueous humor production in order to lower intraocular pressure. There were no medications that targeted the diseased trabecular meshwork (TM) directly. Pilocarpine, a miotic glaucoma drug that works to increase aqueous humor outflow does not directly target the TM. Rather it induces contraction of the ciliary muscle in order to expand the TM and decrease outflow resistance.

Methods: A PubMed, and Med-Line search was carried out to review the recent or new trends in the medical management of glaucoma based on evidence from literature. The PubMed search conducted included the following search terms: Recent OR New OR latest AND Advances OR trends AND Glaucoma medical management and then within the last 5 years

Results: A total of 214 papers were retrieved from the initial search. However after adding a duration of 5 years (only papers published in the last 5 years to the search term), a total of 93 papers were retrieved. Using strict criteria of including only papers that specifically reported medical management of glaucoma and advances or recent trends in medical management, 10 papers were selected.

Discussion: New drug formulations have been developed to improve efficacy and duration of action, decrease the need for multiple medications, decrease side effect profile, improve adherence and improve overall quality of life. New formulations include Latanoprostene and Bunod

0.024% (Vyzulta)² which is a nitrous oxide-donating prostaglandin analogue which acts by increasing both uveoscleral and trabecular outflow through the release of nitrous oxide. It is a once daily dosing and it is indicated for open angle glaucoma (OAG) and ocular hypertension (OHT). Another new medication is Rhopressa (Netarsudil 0.02%)³ which is a Rhokinase transporter inhibitor recently approved in 2017. It lowers IOP by the triple action of reducing aqueous production, increasing trabecular outflow, and decreasing episcleral venous pressure⁴. It is indicated in OAG and OHT. Roclatan is combination of Netarsudil (0.02%) and Latanoprost (0.005%). There are other novel delivery systems such as ocular inserts, (polymer filled drugs) which are designed to be placed in the conjunctival cul-de-sac or in the puncta. The Bimatoprost ocular ring is an example of the ocular inserts. These are mainly to improve adherence to medications. Others include nanoparticle-based topical formulations and contact lens based delivery systems. There are also novel preservatives such as Polyquad, Purite and Sofzia as alternatives to Benzalkonium Chloride which has more side effects. Neuroprotective agents⁵ such as Citicoline, Gingko Biloba are also at different stages of investigation.

Conclusion: Significant progress has been made in the last few years to improve medication adherence by providing more drug delivery methods, alternative medications with fewer side effects associated with the use of better preservatives in anti-glaucoma medications.

References

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