Journal of Pharmaceutical Research International

33(60B): 3090-3092, 2021; Article no.JPRI.76801
ISSN: 2456-9119
(Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759)

A Short Note on Netarsudil

S. Padmaja [a≡] and R. Srivignesh [aφ*]

[a] Department of Pharmacology, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam-603103, Tamil Nadu, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i60B34982

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/76801

Short Communication

Received 20 October 2021
Accepted 24 December 2021
Published 27 December 2021

ABSTRACT

Glaucoma currently affects over 60 million people worldwide and also one of the leading cause of irreversible blindness. Early Medical intervention is the preliminary therapy to prevent the progression of optic nerve damage and vision loss by reducing the Intra Ocular Pressure (IOP). IOP is the regulated balance between production of aqueous humour and the rate of aqueous flow via uveoscleral outflow pathway and trabecular meshwork pathway (TM). There are many groups of drugs like beta blockers, carbonic anhydrous inhibitors, prostaglandin analogues etc., are available. Netasurdil which is the Rho – associated protein kinase (ROCK) inhibitor is the novel group of drugs which has been in research for the Glaucoma.

Keywords: Netarsudil; glacuoma; intraocular pressure.

1. INTRODUCTION

Worldwide, Glaucoma affecting over 60 million people and continues to be the leading cause of irreversible blindness. Medical intervention is the preliminary therapy to progression of optic nerve damage and vision loss prevention by reducing the IOP. IOP is the regulated balance between production of aqueous humour and the rate of aqueous flow via uveoscleral outflow pathway and trabecular meshwork pathway (TM). A new

[≡] *First Year PG;*
[φ] *Second Year PG;*
**Corresponding author: E-mail: ravisrivignesh5694@gmail.com;*

ocular hypotensive glaucoma medication through topical route – Netarsudil is approved by the FDA in December 2017 [1].

2. MECHANISM OF ACTION

Netarsudil is a potent inhibitor of Rho – associated protein kinase (ROCK). ROCK is a serine/threonine protein kinase which accelerates the actin stress fibres assembly and focal adhesion within the trabecular meshwork [2-4]. Netarsudil acts by three novel mechanisms for lowering Intraocular pressure [1]. First is it lowers the IOP by relaxation of TM and ciliary muscle contraction which leads to increase in the outflow of aqueous by the conventional method [1]. Second, by ROCK1 & ROCK2 inhibition which are usually present in higher amounts in the trabecular meshwork. Lastly by decreasing the episceleral venous pressure and decreasing the production of aqueous humor [1].

3. INDICATION

Netarsudil is used in open angle glaucoma or ocular hypertension for the purpose of elevated intraocular pressure [5] reduction.

4. DOSAGE

Netarsudil Ophthalmic solution containing 0.2 mg/mL.

5. PHARMACOKINETICS

The systemic exposure of Netarsudil were evaluated in 18 adults and it was found that no quantifiable plasma concentration of netarsudil was found following the post dose day 1 and day 8. Metabolised by esterases in the eyes after ocular dosing [5].

6. ADVERSE EFFECTS

Most occuring ocular adverse effects with Netarsudil is conjunctival hyperemia, corneal verticillata, instillation site pain, conjunctival hemorrhage [5].

7. NONCLINICAL TOXICOLOGY [5]

Netarsudil is not mutagenic in mouse. Regarding carcinogenicity and fertility, long term studies have not been performed.

8. USES IN SPECIFIC POPULATION [5]

Pregnancy –Data is not available on Netarsudil for the use in pregnant women for any associated risk. In pregnant rats and rabbits, on i.v. administration during the period of organogenesis, Netarsudil does not produce any fetal abnormalities in rats and rabbits.

9. GERIATRIC USE [5]

There was no differences in terms of safety or effectiveness have been observed between geriatric and other adult patients.

10. CLINICAL STUDIES

Netarsudil was evaluated in three randomized and controlled trials, with open angle glaucoma or ocular hypertension patients. In Study 1 & 2 enrolled subjects with baseline IOP < 27mm hg and study 3 enrolled subjects with base line IOP < 30 mm hg. The duration was 3 months for study 1, 12 months for study 2 & 6 months for study 3. All three studies have demonstrated the reduction of IOP of 5mm hg for subjects treated with Netarsudil 0.02% once daily in the evening [5].

11. CONCLUSION

Netarsudil has a mechanism of action and it is unique through which it lowers the IOP. Also it has notable side effect of conjunctival hyperemia which could be treated by administering once in a day before bed time. In general, Netarsudil may be helpful to the normotensive or steroid induced glaucoma [1] patients.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Dasso L, Al-Khaled T, Sonty S, Aref AA. Profile of netarsudil ophthalmic solution and its potential in the treatment of open-angle glaucoma: evidence to date. Clinical Ophthalmology (Auckland, NZ). 2018;12: 1939.
2. Hoy SM. Netarsudil ophthalmic solution 0.02%: first global approval. Drugs. 2018;78(3):389-96.
3. Mundorf T, Mah F, Sheng H, Heah T. Effects of Netarsudil on the Corneal Endothelium: Three-Month Findings from a Phase 3 Trial. Ophthalmology Glaucoma. 2020;3(6):421-5.
4. Mehran NA, Sinha S, Razeghinejad R. New glaucoma medications: latanoprostene bunod, netarsudil, and fixed combination netarsudil-latanoprost. Eye. 2020;34(1):72-88.
5. Product Information of Netarsudil – FDA.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/76801