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# CASE REPORT OF RETICULAR EPITHELIAL CORNEAL EDEMA (RECE) OCCURED AFTER USE OF RIPASUDIL 0.4% IN UNEVENTFUL POST OPERATIVE CATARACT SURGERY

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## ABSTRACT

**Introduction:** Case report of Reticular epithelial corneal edema (RECE) occurred after use of ripasudil 0.4% (Rho kinase-I inhibitor) in post operative cataract surgery.

## CASE REPORT

This was retrospective observational non randomized study. In this study 2 patients were included which underwent uneventful phacoemulsification surgery for cataract in between November 2023 to December 2023. Out of two patients one had a cataract grade of NS2+, PSC1+, and other had a NS2+, PSC2+, CC1+. Systemic and general examination of patient was normal and noncontributory. Patients was seronegative for HIV and HBsAg. These 2 patients were subjected to detailed ophthalmic examination without any previous history of any corneal pathology. They both had generalized corneal edema with IOP spike of 25 mm of hg and 24 mm of hg respectively on post operative day one. These two patients were started on Ripasudil 0.4% BID after uneventful phacoemulsification surgery on post operative day one along with antibiotic, and steroid eye drop.

These patients developed distinctive honeycomb pattern of RECE after starting Rho kinase-I inhibitor i.e. ripasudil 0.4%. These patients had symptoms of ocular surface discomfort along with bullae with decreased in visual acuity after 3-4 days of installing ripasudil 0.4%. Bullae subsequently resolved after discontinuation of ripasudil 0.4% in 6-7 days.

## DISCUSSION

Rho kinase-I inhibitors (ROCK-I) lower the intraocular pressure (IOP) by increasing the aqueous humour outflow through trabecular meshwork by disrupting actin stress filaments and decreasing cell stiffness. It is an "OUT FLOW" drug that reduces IOP by stimulating the movement of aqueous humour from the ciliary body away from the eye. It is a selective rho-associated coiled-coil-containing protein kinase 1 (ROCK1). Other areas of potential use include as a neuroprotective agent by reducing axon cell apoptosis, to enhance endothelial healing and function, resulting in decreased corneal edema, as an anti-fibrotic agent to slow down or prevent tissue scarring following glaucoma filtration surgery, and, to attenuate retinal neovascularization and reduce the areas of avascular retina and thus may have potential in retinal neovascular diseases such as diabetic retinopathy. The exact cause of RECE is not known. Some ophthalmologist postulated a shift in some of the preexisting stromal edema to the corneal epithelial layers causing RECE. Rho kinase, a serine/threonine-protein kinase, is instrumental in regulating and modulating cell shape and size by changes on the cytoskeleton.

Ripasudil is known to cause rounding of the cell bodies of the trabecular meshwork; the same mechanism could also lead to the rounding of epithelial cells. On confocal microscopy, stratified squamous epithelial cells were seen to adopt spindle shape with loss of cell polarity and organized stratification. Some study also reports that transient alteration in morphology of endothelial cells has also been seen associated with ripasudil 0.4%.

## CONCLUSION

RCEC may be the novel side effect of Rho kinase-I inhibitor. The presence of corneal edema and endothelial decompensation seem to be a risk factor, and cautious use is warranted in these patients. RECE causes not only DOV but also bullae-associated foreign-body sensation and ocular discomfort. they act as a double-edged sword by decreasing stromal edema and causing epithelial edema. ROCK-I act as a double-edged sword in patients with endothelial decompensation. Large-scale studies are required to know the exact incidence, pathophysiology, and long-term consequences of the aforementioned side-effect.

**Photo 1.0: Shows clinical photo of corneal edema on POD-1 after uneventful cataract surgery.**

**Photo 1.1: Shows typical honeycomb appearance of RCEC (POD-5) after use of ripasudil 0.4%.**