

ABSTRAK

Latar belakang

Peningkatan resistensi aliran keluar humor akueus akibat perubahan mikrostruktur trabekular meshwork (TM) berkontribusi terhadap peningkatan tekanan intraokular (TIO) pada glaukoma akibat kortikosteroid. Penghentian kortikosteroid merupakan tatalaksana utama, tetapi bukti reversibilitas perubahan histologis masih terbatas.

Tujuan

Menilai pengaruh penghentian prednisolon asetat topikal terhadap TIO serta ketebalan matriks ekstraseluler TM dan dinding dalam kanalis Schlemm pada tikus Wistar.

Metode

Empat belas tikus Wistar dibagi acak menjadi kelompok kontrol dan perlakuan. Kelompok perlakuan diberi prednisolon asetat 4×/hari selama 4 minggu, kemudian dihentikan 4 minggu. TIO diukur pada baseline, pasca paparan, dan pasca penghentian. Preparat jaringan diwarnai hematoksilin-eosin; ketebalan TM dan dinding dalam kanalis Schlemm diukur kuantitatif. Analisis menggunakan t-test, ICC, dan korelasi Pearson.

Hasil

Rerata TIO meningkat dari $22,29 \pm 0,76$ menjadi $26,29 \pm 1,11$ mmHg ($p=0,001$), lalu menurun menjadi $22,71 \pm 0,76$ mmHg ($p=0,001$). Tidak terdapat perbedaan bermakna antara baseline dan pasca penghentian ($p=0,248$). Ketebalan dinding Schlemm lebih besar pada kelompok perlakuan ($3,45 \pm 0,73$ μm) dibanding kontrol ($2,40 \pm 0,71$ μm ; $p<0,001$). Terdapat korelasi positif sedang antara ketebalan dan TIO ($r=0,545$; $p=0,044$).

Kesimpulan

Penghentian prednisolon asetat menurunkan TIO dan berhubungan dengan perubahan mikrostruktur trabekular yang bersifat reversibel.

Kata kunci

Corticosteroid-induced glaucoma; prednisolon asetat; tekanan intraokular; trabekular meshwork; kanalis Schlemm.

ABSTRACT

Background:

Increased outflow resistance due to microstructural alterations in the trabecular meshwork contributes to elevated intraocular pressure (IOP) in corticosteroid-induced glaucoma. Discontinuation of corticosteroid use is the main treatment strategy, but evidence supporting the reversibility of histological changes remains limited.

Objective

To evaluate the effect of topical prednisolone acetate withdrawal on IOP and the thickness of the extracellular matrix (ECM) in the trabecular meshwork and inner wall of Schlemm's canal in Wistar rats.

Methods

Fourteen Wistar rats were randomly divided into control and treatment groups. The treatment group received topical prednisolone acetate four times daily for 4 weeks, followed by withdrawal for 4 weeks. IOP was measured at baseline, post-exposure, and post-withdrawal. Tissue samples were stained with hematoxylin-eosin; ECM thickness of the trabecular meshwork and inner Schlemm's canal wall was quantitatively measured. Data were analyzed using t-tests, Intraclass Correlation Coefficient (ICC), and Pearson correlation.

Results

Mean IOP increased from 22.29 ± 0.76 to 26.29 ± 1.11 mmHg ($p=0.001$), then decreased to 22.71 ± 0.76 mmHg after withdrawal ($p=0.001$). No significant difference was found between baseline and post-withdrawal ($p=0.248$). Schlemm's canal thickness was higher in the treatment group (3.45 ± 0.73 μm) than in controls (2.40 ± 0.71 μm ; $p<0.001$). A moderate positive correlation was observed between canal thickness and IOP ($r=0.545$; $p=0.044$).

Conclusion

The discontinuation of prednisolone acetate reduces intraocular pressure and is associated with reversible microstructural changes in the trabecular meshwork.

Keywords:

Corticosteroid-induced glaucoma; prednisolone acetate; intraocular pressure; trabecular meshwork; Schlemm's canal.