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Volume 34, Issue 1-2, 1 January 2018, Pages 214-223

Ocular permeation of topical tazocin and its effectiveness in the treatment of pseudomonas aeruginosa induced keratitis in rabbits (Article)

Singh, S.^a, Agarwal, R.^b, Razak, Z.A.^c, Ngu, R.^a, Nyein, L.L.^d, Vasudevan, S.^d, Kapitonova, M.^{de}, Kadir, A.J.^a, Visvaraja, S.^a^aDepartment of Ophthalmology, University of Malaya, Kuala Lumpur, Malaysia^bCenter for Neuroscience Research, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia^cIUM-International Islamic University Malaysia, Kuantan, Pahang, Malaysia[View additional affiliations >](#)

Abstract

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Purpose: Pseudomonas aeruginosa is the most common causative organism for contact lens-associated corneal ulcer and is commonly treated with fluoroquinolones. With the emergence of resistant strains, it is important to investigate alternative therapies. Despite well-established efficacy of tazocin against systemic Pseudomonas infections, its topical use for the treatment of Pseudomonas keratitis has not been described, hence this study was aimed to find the ocular permeation of Tazocin and its efficacy in treating keratitis in rabbit eyes. **Methods:** We investigated the ocular permeation of topical tazocin after single drop application in normal rabbit eyes by estimating piperacillin and tazobactam concentrations in cornea, aqueous, and vitreous using a validated LC-MS/MS method. Furthermore, we determined the efficacy of repeated dose administration of tazocin against experimentally induced P. aeruginosa keratitis in rabbits in comparison to moxifloxacin. To determine the efficacy, clinical examination, histopathological examination, and estimation of bacterial load and inflammatory cytokines in cornea were done. **Results:** Significant corneal concentration of piperacillin and tazobactam was detected in normal rabbit corneas after single dose treatment with tazocin. In rabbits with Pseudomonas-induced keratitis, topical tazocin caused significant clinical and histopathological improvement. This improvement was associated with reduction in corneal bacterial load and inflammatory cytokines. Compared to moxifloxacin 0.5%, tazocin treated group showed greater clinical response which was associated with higher interleukin (IL)-1 β , lower tumor necrosis factor (TNF)- α , a comparable level of IL-8, greater reduction in corneal bacterial load, and lesser inflammatory cell infiltration. **Conclusion:** Tazocin showed good ocular penetration and was effective in treatment of Pseudomonas induced keratitis in rabbits. © Copyright 2018, Mary Ann Liebert, Inc.

Reaxys Database Information

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Author keywords

bacterial keratitis contact lens induced ulcer Pseudomonas aeruginosa tazocin

Indexed keywords

EMTREE drug terms: interleukin 1beta interleukin 8 moxifloxacin piperacillin plus tazobactam tumor necrosis factor

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Chemicals and CAS Registry Numbers:

interleukin 8, 114308-91-7; moxifloxacin, 151096-09-2

Drug tradename:

tazocin

Funding details

Funding number	Funding sponsor	Acronym	Funding opportunities
H-20001-00-E000058	Universiti Malaya Ministry of Higher Education, Malaysia	UM MOHE	

Funding text

Authors acknowledge the following financial support for the study: Grant number 600-RMI/RACE 16/6/2 (13/2013) by Ministry of Higher Education, Malaysia; HIR grant number H-20001-00-E000058 by University of Malaya, Malaysia.

ISSN: 10807683

CODEN: JOPTF

Source Type: Journal

Original language: English

DOI: 10.1089/jop.2017.0098

Document Type: Article

Publisher: Mary Ann Liebert Inc.

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