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Argon cold plasma – a novel tool to treat therapy-resistant corneal infections

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ABSTRACT**Purpose:**

To test whether therapy-resistant corneal infections can be successfully treated with argon cold plasma to reduce or eliminate pathogen microorganisms without affecting corneal cell viability.

Design:

First-in-man case series and experimental study.

Methods:

Cold plasma effects on viability of primary human corneal limbal epithelial cells were studied using exposure times from 0.5 to 10 minutes (metabolic activity, oxidative stress, apoptosis). Disinfective potential of cold plasma was tested against common pathogens (*Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Candida albicans*) on culture medium and evaluated by counting colony-forming units and optical density measurements, as well as against *Staphylococcus aureus* in a human cornea infection model. Additionally, in a first-in-man trial four patients with therapy-resistant corneal ulcers were treated to evaluate the clinical potential of cold plasma.

Results:

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