

6th World Congress and Expo on **Applied Microbiology**
&
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&
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Impact of commonly used topical agents and anti-*Acanthamoeba* drugs on *Acanthamoeba* spp. viability

Anas Hamad

University of Wolverhampton, U K

Acanthamoeba keratitis (AK) is one of the most difficult ocular infections to diagnose and manage successfully. Diagnosis relies on culture-based techniques after the patient has undergone a corneal scrape to remove infected tissue. The sample is then incubated on non-nutrient agar covered with a lawn of *E. coli* for 7-10 days but has a poor sensitivity of around 50%. Even after diagnosis many patients fail to respond to treatment even when the organism shows *in vitro* drug sensitivity and this infection can result in permanent blindness. The aim of this study was to investigate the effect of a variety of topical ophthalmic drugs against *Acanthamoeba* spp. Drugs included anaesthetics used in the corneal scrapes, empirical antibiotics/antivirals which are often given prior to an AK diagnosis and agents that are routinely used in the treatment of AK. The outcomes from the present study showed that topical anaesthetics used in the corneal scrape including: proxymetacaine, oxybuprocaine and particularly tetracaine were all toxic to the trophozoites and cysts of *Acanthamoeba* spp. but lidocaine was not toxic to the trophozoites and cysts. Compounds including PHMB were show to have good activity against both cysts and trophozoites, but propamidine which is often used in treatment was found to have no activity. This study has demonstrated that the presence of the benzalkonium chloride (BAC) preservative in propamidine (Brolene®) eye drops is likely to be solely responsible for the observed anti-amoebic activity. The presence of BAC as a preservative in levofloxacin drops caused a high level of toxicity to trophozoites and cysts of *Acanthamoeba* spp. Overall the results indicated the selection of anaesthetic may have an effect on the sensitivity of the culture from corneal scrape. The current study has shown that the anti-amoebic effect of BAC, povidone iodine and tetracaine are more *in vitro* active against *Acanthamoeba* spp. with clear signs of damage from the transmission electron microscopy observations, compared with the current diamidines including; propamidine and hexamidine and slightly lower to the biguanides including; PHMB and chlorhexidine which they used in the treatment for AK.

Biography

Anas's currently a PhD research student in his 3rd year at the University of Wolverhampton, School of Biomedical Science and Physiology, under the supervision of Dr. Wayne Heasgrave. Anas's a motivated student and he has a number of skills in his field research (Medical Microbiology). He is planning to present a poster in the 6th World Congress and Expo on Applied Microbiology conference, which will be held at Rome, Italy on October 21-22, 2019.

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