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Organization Section: NCC/ BCLA

Poster Abstracts

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Disinfection efficacy of a unique multi-purpose solution and comparator multi-purpose solutions against acanthamoeba trophozoites and cysts

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Purpose: A unique contact lens multi-purpose solution (MPS-1; Biotrue Advanced) and 2 currently marketed MPSs were tested for disinfection efficacy against standard and non-standard strains of Acanthamoeba trophozoites and cysts.

Method: A. castellanii (A.c, ATCC 50370, PRA-105, 50498) and A. polyphaga (A.p, ATCC 30461, 50371, 50495) trophozoites were tested per new ISO 19045-2 methodology. Trophozoites and cysts were prepared to challenge three MPSs: MPS-1 (0.00015% polyquaternium-1 [PQ-1], 0.0005% polyaminopropyl biguanide, 0.00025% alexidine dihydrochloride); MPS-2 (0.0006% myristamidopropyl dimethylamine, 0.001% PQ-1); MPS-3 (0.00016% alexidine dihydrochloride, 0.0003% PQ-1). Per instructions for use, disinfection by MPS-1 was assessed 4 hours post-inoculation and MPS-2 and -3 assessed after 6 hours. Acanthamoeba recovery was determined via Spearman-Karber method; log10 reduction values (LRVs) were analyzed with one-way ANOVA with Tukey's multiple comparison tests performed using Graphpad Prism.

Results: All MPSs exhibited disinfection efficacy against all A.c and A.p trophozoites tested; MPS-1 and -2 (mean LRVs 3.6 each) particularly showed increased disinfection efficacy towards A.c PRA-105 versus MPS-3 (mean LRV 2.6, $P<0.001$). MPS-1 and -3 (mean LRV 3.3 and 3.4; 3.4 and 2.6) showed greater efficacy than MPS-2 (mean LRV 0.6 and 0.0; all $p<0.002$) towards A.c 50370 and A.p 30461 cysts, respectively. MPS-1 and -3 (mean LRVs 2.8 each) had greater efficacy towards A.c PRA-105 cysts versus MPS-2 (mean LRV 0.1, both $p<0.0001$). MPS-1 and -3 (mean LRV 1.3 and 0.8) had greater efficacy towards A.c 50498 cysts versus MPS-2 (mean LRV 0.0, $p<0.001$ and $p<0.05$). MPS-1 and -3 (mean LRVs 1.0 each) had greater efficacy towards A.p 50371 cysts versus MPS-2 (mean LRV 0.0, $p<0.01$). MPS-1 and -3 showed a non-significant greater efficacy versus MPS-2 towards A.p 50495 cysts.

Conclusions: All MPSs demonstrated efficacy against tested trophozoites; MPS-1 demonstrated greater disinfection against one trophozoite strain and several cyst strains. ISO 19045-2 testing confirms this MPS effectively disinfects these Acanthamoeba strains.

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