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Temporal Efficacy and Sterility Testing of Povidone-Iodine from an Open Bottle

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Investigative Ophthalmology & Visual Science June 2023, Vol.64, 596. doi:

Abstract

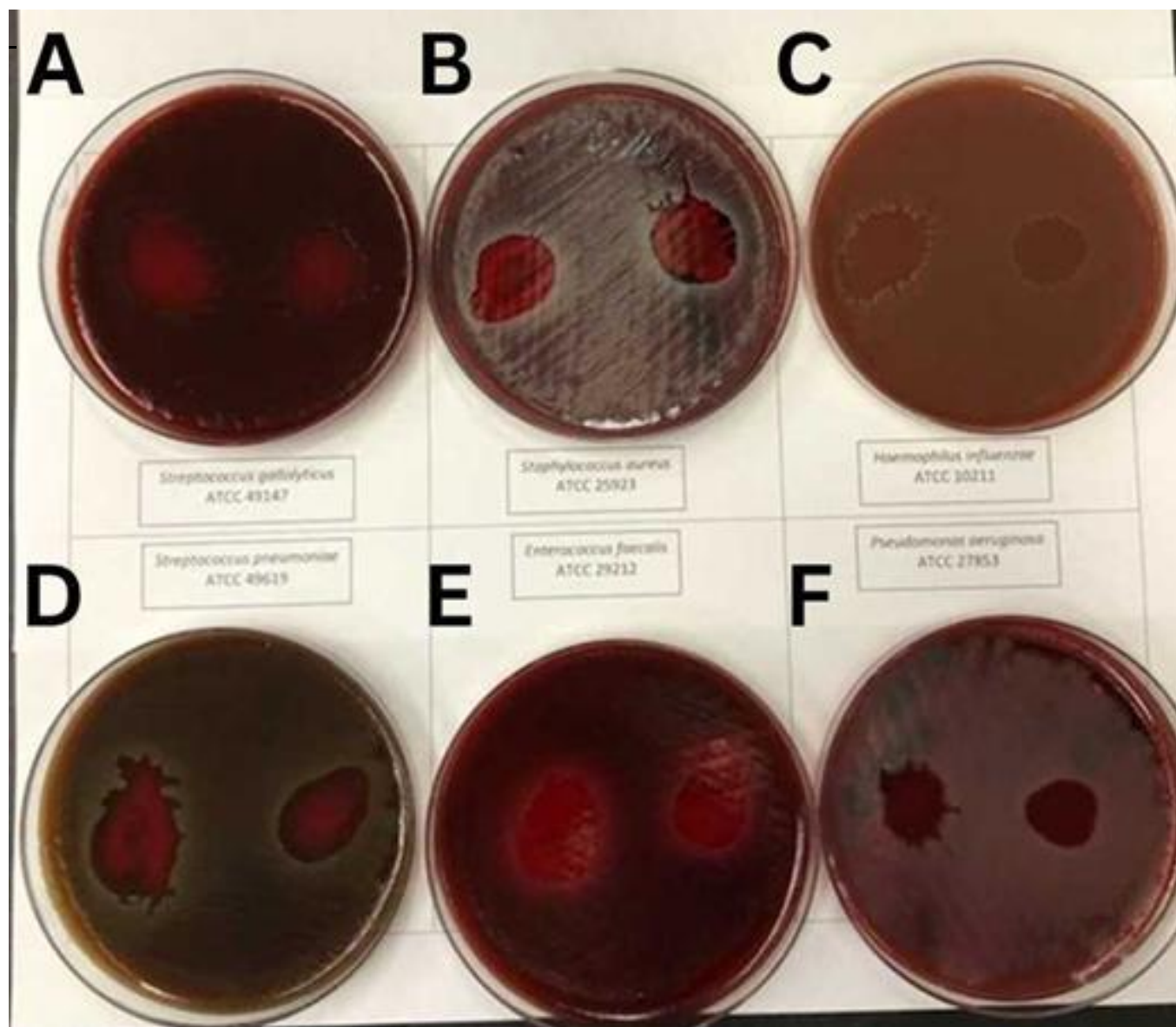
Purpose : The povidone-iodine (PI) used for post-injection endophthalmitis prophylaxis is commonly manufactured in large single-use bottles, even though only a few drops are required per patient. There is a lack of data regarding PI's efficacy against organisms that commonly cause endophthalmitis with repeated uses from the same bottle over multiple days. Therefore, we performed an in vitro study to investigate PI's sterility and temporal efficacy against bacteria associated with post-injection endophthalmitis.

Methods : There were two separate protocols performed in this experimental study. The first evaluated the sterility of PI (Betadine, 5% Ophthalmic Prep Solution, 30mL) from a newly opened bottle over five days. The PI bottle was opened on day zero and inoculated onto sheep blood agar plates (BAPs). The plates were checked 24 hours later for bacterial growth. This process was repeated for five consecutive days using the same bottle of PI. The second protocol tested PI's antibacterial efficacy over five days. PI from a newly opened bottle was applied to bacterial lawn plates of quality control strains of *Staphylococcus*, *Streptococcus*, *Enterococcus*, *Pseudomonas*, and *Haemophilus* species. The plates were then evaluated 24 hours later for a clear zone of inhibition (i.e., no growth) where the PI was placed. This process was repeated for five consecutive days using the same bottle of PI.

Results : Sterility testing showed no growth of organisms on the BAPs for each of the five days of testing. For antibacterial efficacy testing, zones of inhibition of growth were seen on each plate of bacterial colonies only where PI was placed, for each of the five days of testing (image).

Conclusions : In this study, PI from an open bottle maintained its sterility and antibacterial efficacy for five days. This data could help support repeated use of the same bottle, reducing waste and costs for ophthalmology practices.

This abstract was presented at the 2023 ARVO Annual Meeting, held in New Orleans, LA, April 23-27, 2023.



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Photos of bacterial lawns demonstrating clear zones of inhibition for each of the tested bacteria using a povidone-iodine bottle that had been opened five days prior. A. *Streptococcus gallolyticus*, ATCC 49147. B. *Staphylococcus aureus*, ATCC 25923. C. *Haemophilus influenzae*, ATCC 10211. D. *Streptococcus pneumoniae*, ATCC 49619. E. *Enterococcus faecalis*, ATCC 29212. F. *Pseudomonas aeruginosa*, ATCC 27853.

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