ISSN: 2659-2029
Proceedings of the 5th Research Symposium of the Faculty of Allied Health Sciences
University of Ruhuna, Galle, Sri Lanka
August 26, 2022

PP 21

Determination of the Effectiveness of Selected Disinfectants Available in a Medical Laboratory Setting

Jinadasa A.A.C.A.[1#], Peiris H.H.[1], Wickramasinghe S.S.[2]
[1]*Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka*
[2]*Department of Microbiology, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka*

[#]***Corresponding author:*** *cajinadasa@gmail.com*

Background: Sterilization is a process that kills all forms of microbial life using physical or chemical sterilization methods. As the gold standard method for physical sterilization, autoclaving is used in medical laboratory setup. It is reported that disinfectants can be used when autoclaving is not possible.

Objectives: To determine the effectiveness of selected disinfectants in a medical laboratory setting.

Methods: Different concentration gradients of three disinfectants namely, glutaraldehyde (0.75%-2%), sodium hypochlorite (0.5%-1.75%), and lysol (0.5%-10%) were prepared and tested against standard cultures of *Staphylococcus aureus* (ATCC 25923), *Escherichia coli* (ATCC 25922), *Pseudomonas aeruginosa* (ATCC 27853) and *Bacillus subtilis* (ATCC 6633). A constant inoculum of each organism (1.5×10^8 CFU/mL) was allowed to interact with each disinfectant concentrations, at different time intervals from 3 to 16 hours. Minimum Inhibitory Concentration (MIC) of each disinfectant at different time period was recorded by observing the turbidity of each well using microtiter plate method. To investigate Minimal Bactericidal Concentration (MBC), same volume from each well of the above (from 3 to 16 hours) microtiter plates was sub-cultured on Muller Hinton Agar at 37ºC for 24 hours and recorded whether the standard organisms were grown or not.

Results: *S. aureus*, *E. coli* and *B. subtilis* were destroyed by all the selected concentrations of glutaraldehyde and lysol in 3 hours. However, they were destroyed by sodium hypochlorite in 8 hours at the selected concentrations. *P. aeruginosa* was effectively destroyed by all the concentrations of glutaraldehyde in 3 hours, and 2.5% of lysol was effective in killing it in 3 hours. None of the selected concentrations of sodium hypochlorite at 16 hours were able to destroy *P. aeruginosa.*

Conclusions: The most effective chemical sterilant is 0.75% glutaraldehyde whereas 2.5% lysol is the best alternative to glutaraldehyde that can be used in medical laboratory setup. Although sodium hypochlorite is an effective chemical sterilant for *S. aureus, E. coli* and *B. subtilis*, it is not an effective sterilant for *P. aeruginosa*. These concentrations of each disinfectant will work for that particular inoculum.

Keywords: *Disinfectants, Effectiveness, MBC, MIC, Sterilization*