

**Title: EFFECTIVENESS OF CHEMICAL AND PHYSICAL ANTIMICROBIAL AGENTS IN HEALTH ATTENDANCE SURFACES.**

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**Abstract:**

The disinfection of surfaces in health attendance places is a very important procedure, which avoids patients and professionals contamination with potentially pathogenic microorganisms. In this study, we evaluate the effectiveness of some chemical and physical antimicrobial agents, which are generally used in health attendance places. We also assayed the synergic combination of two less toxic agents in the disinfection process. We test solutions containing, 70% alcohol, 0,45% quaternary ammonium, 0,2% peracetic acid and ultraviolet radiation (UV). Each agent was tested with six bacterial species: *Escherichia coli*, *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Klebsiella sp.*, *Enterococcus sp.*, *Staphylococcus aureus* and three samples of Methicillin Resistant *S. aureus* (MRSA), isolated from human microbiota. All bacterial strains were cultivated (18 h) in LB broth and with a swab we spread each culture in a demarcated smooth stone surface (15x20cm). After that, with a new swab we took a sample from contaminated area and strew it on Nutrient Agar plates to evaluate the recovery of bacterial strains. After that, we disinfected the surface with antimicrobial agents, and took another sample to analyze the presence of viable microbial cells. The alcohol exhibited bactericide action against *E. coli*, *P. aeruginosa* and *Enterococcus sp.*, however for the others species, it has shown less antimicrobial activity. The quaternary ammonium was not active to *Klebsiella sp.* and *P. aeruginosa*, but efficiently killed the other microorganisms. The peracetic acid showed excellent bactericide action to all tested microorganisms. The UV reduce the viable bacterial cells after 5 min. of exposition, but showed bactericide effect after 15 minutes of exposition, however some *S. aureus* (MRSA) cells grow after 15 min. We isolated this cells and made an antibiotic susceptibility test, where the isolate present Oxacillin resistant. We also tested the synergic effect of the concomitant use of alcohol and UV. This strategy resulted in no bacterial recovery after the treatment, even when MRSA was tested. Peracetic acid is considered an excellent antimicrobial chemical agent. In fact, in our study its use resulted in no bacterial recovery. Beyond that, UV/Ethanol effect was equivalent to peracetic acid use, with the advantage of been less toxic. We conclude that the synergism between alcohol 70% and UV can be an efficient alternative to surfaces disinfection in health attendance places.

**Keywords:** Surface disinfection, Antimicrobial agents, Synergism, MRSA