

Can we reduce microbial burden in frail patient care by dry fog disinfection?

Katarina Dostáaova^{1,2}, Jan Mikas^{1,2}, Viera Paštraáková², Mária Kmetová², Andrea Kolosova^{1,2}, Michal Adamisin¹, Jan Hrouzek³, Pavol Pavlovic³, Stefania Moricova^{1,2}

1-Faculty of Public Health, Slovak Medical University, Bratislava, Slovakia

2- University Hospital Bratislava, Slovakia

3-Detectair Technologies s.r.o., Bratislava , Slovakia

Context: A general practitioner (GP) who cares for elderly patients discharged from hospital to a home or nursing home faces the challenges of healthcare-associated infections (HAIs). **An antimicrobial dry fog disinfection is a new modality of multimodal infection control strategy.**

Objectives: To assess the effectiveness of antimicrobial **dry fog disinfection (DFD)** in the open healthcare microenvironment of a long-term care department consists of 10 (2-3 bed) rooms, average of 252 patients hospitalized annually average of 21 days. Most of patients are discharged to home care and to nursing home.

Methods: We analysed the microbiological contamination of surfaces and air in patient rooms.



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Results:

I. We analysed the microbiological contamination of surfaces. Before the DFD application, we detected: Staphylococcus epidermidis, a potential cause of HAIs, Enterobacteriaceae and Pseudomonas aeruginosa, clinically serious pathogens (urinary, respiratory tract and wound infections), Bacillus spp. and Micrococcus spp., a common part of the environment, but indicate general contamination. In one sample, Penicillium spp. was also present, indicates the presence of Mold. **After the application of DFD, all tested surfaces were negative for pathogens such as Staphylococcus, aureus, Pseudomonas aeruginosa, Enterobacteriaceae or yeast.** Only occasionally were detected Bacillus spp. and Micrococcus spp., which are considered non-pathogenic, environmental bacteria, naturally present in the environment.

II. We analysed the microbiological contamination of air. Before disinfection, the total number of microorganisms reached 304 - 393 CFU (Colony Forming Units) /m³, which represents high environmental contamination. Molds were captured in the cut (118 – 142 CFU/ m³). Yeasts and Staphylococcus spp. were not detected before disinfection. After DFD the total number of microorganisms dropped to 73 – 102 CFU/m³. Molds were reduced to 53 – 73 CFU/ m³. Yeasts and Staphylococcus spp. were not detected even after disinfection. **DFD reduced the microbial load of the air by 70-80%.**

Discussion: The practice requires further studies in the future so that the effectiveness of DFD can be assessed more comprehensively

Conclusion: The use of **dry fog disinfection has the potential to significantly reduce the microbial burden as part of a comprehensive HAI prevention strategy** in department predominantly caring of frail patients and then facilitate the work of GPs after discharge.

