Disinfection of patient rooms, using dry mist of hydrogen peroxide

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Background. To control the spread of pathogens in hospital environments, good hygienic routines based on cleaning and disinfection of surfaces contaminated with biological materials are obligatory requirements. Chemicals like chlorine and 5% chloramine have traditionally been used for surface disinfection purposes for a final room disinfection in Norway. In this study a patented programmable device which provides a dry mist of hydrogen peroxide disinfectant is tried for room and surface decontamination.

Materials and methods. The technology produces hydrogen peroxide particles of such a small size that they circulate freely in the air – as a mist – making disinfectant accessible to all surfaces (Sterinis-Gloster Santé Europe). The test room was closed and all openings taped to control the concentration of the mist. The concentration of hydrogen peroxide was programmed according to the volume of the enclosed room. The robot was placed in a corner to get the most effective mist concentration apr. 2m in front. Three preset cycles of hydrogen peroxide dry, 17.4 ppm, mist were done. Each time the diffusion time was 26 minutes, followed by increasing contact time; 30 min, 60 min and 120 minutes.

Spores of Bacillus Subtilis Raven 1162282 were placed on a table, on walls, and outside different medical equipments in the middle of the room. The spore envelopes were either opened or unopened before the disinfection test was performed. The spores were removed after 18 – 20 hours.

Results. Preliminary result from disinfection of the enclosed room showed no growth in 6/6 tests. Repetitive tests were done for 11 days. The hydrogen peroxide treatment disinfected 33/42 spores (78.6%) in opened envelopes, and 94/104 (90.4%) in closed envelopes.

The treatment was effective in 127/146 (87%) of all tests.

Conclusion: The use of hydrogen peroxide dry mist programmed to a preset concentration, may be an effective method to decontaminate critical enclosed areas, including isolation units, clean rooms, and general areas contaminated with pathogens. Further studies are needed.