

Prospective cluster-controlled crossover trial to compare the impact of an improved hydrogen peroxide disinfectant and a quaternary ammonium-based disinfectant on surface contamination and healthcare outcomes

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ABSTRACT

This study compared the efficacy of a quaternary ammonium compound (Quat)-based disinfectant and an accelerated hydrogen peroxide (AHP[®]) disinfectant when used to clean high-touch surfaces in hospital wards. Bacterial counts were significantly reduced in the AHP[®] trials, and high-touch surfaces yielded no growth significantly more often when AHP[®] was used.

BACKGROUND

Although widely used in healthcare, quaternary ammonium (Quat)-based disinfectants carry several disadvantages compared to other disinfectant products. This study compared the efficacy of AHP[®] wipes and a quat disinfectant when used to reduce surface contamination and related health care outcomes.

STUDY

This study was conducted across 2 campuses at a university-affiliated hospital. On each campus, 2 wards were randomized to either have housekeepers continue to clean using their regular quat-based product, or to perform these tasks using AHP[®] wipes. After 6 months, the assignment of product to ward was switched, and the study continued for an additional 6 months. Samples

from several high-touch surfaces were cultured onto agar contact plates and log reduction in bacterial concentration was measured. A composite measure of incidence densities for MRSA, VRE and *C. difficile* was used to evaluate healthcare outcomes.

RESULTS

Aerobic colony counts (ACCs) were used as a metric to assess the degree to which bacteria flourished on high-touch surfaces. When AHP[®] was used, ACCs were significantly lower than the surfaces on which the Quat was used. In addition to this, high-touch surfaces yielded no growth after cleaning with AHP[®] significantly more often than when the Quat product was used. The authors found a 23% lower incidence density (composite measure) of healthcare outcomes caused by VRE, MRSA and *C. difficile* when AHP[®] was used, provided wipe rates were ≥80%, though this was not statistically significant.

CONCLUSION

These findings suggest that AHP[®]-based disinfectant products are more effective than their Quat counterparts at eliminating bacteria on surfaces.

Quat-based disinfectants are ubiquitous throughout healthcare settings, but carry several key disadvantages:

firstly, the 10-minute contact time most often associated with these products is unrealistic in time-constrained healthcare practices. In addition to this, these products have limited efficacy against non-enveloped viruses and various other hard-to-kill pathogens, and will require an additional product to supplement to supplement their use.

AHP[®]'s impressive efficacy profile, combined with its short contact time and effectiveness in the presence of organic material position this chemistry as the optimal choice for routine disinfection of healthcare surfaces.

REFERENCES

1. Boyce JM, Guercia KA, Sullivan L, Havill NL, Fekieta R, Kozakiewicz J, Goffman D. (2017). Prospective cluster-controlled crossover trial to compare the impact of an improved hydrogen peroxide disinfectant and a quaternary ammonium-based disinfectant on surface contamination and health care outcomes. *American Journal of Infection Control*. 45, 1006-1010.