

DIRECT COMPARISON OF QUAT & AHP

Study by Dr John Boyce and others (AJIC, 2017)

Study Summary:

This landmark 12-month study is very powerful. It is the first ever prospective cluster-controlled crossover trial that directly compares two disinfectant classes in a real world setting (quat versus AHP in a major teaching hospital).

Surface contamination across all metrics (including HAI rates) was significantly better with AHP (Oxivir) than with quat.

Study Description:

The 52-week study was undertaken in 4 critical care wards of 2 separate campuses of a major American teaching hospital. On each campus, 2 wards were randomised to either quat disinfectant wipes (benzylkonium chloride; Hyperfect 256), which was the disinfectant already in use in the hospital, or AHP disinfectant wipes (Oxivir Tb).

Rooms of patients with *C. difficile* infection (CDI) in the quat arm of the study were cleaned with the quat wipe, and then in a second step with bleach (as was the existing hospital practice).

CDI rooms in the AHP arm were only cleaned with AHP (in accordance with Alfa, AJIC 2015, who demonstrated that daily disinfection with Oxivir wipes reduced CDI without the need for bleach).

After 6 months, each ward disinfectant arm was reversed. Validation was performed by Vericlean™ fluorescent marker. Cultures of disinfected surfaces before and after cleaning were also performed by a single microbiology technologist to eliminate error bias.

Outcomes included:

- pathogen colony counts
- % of surfaces yielding zero growth after cleaning
- nosocomial (in-hospital) acquisition of VRE, MRSA and *C. difficile*

Results:

1. Colony counts cultured after cleaning were significantly lower with AHP than with quat ($p=0.003$):
 - Oxivir Tb → 14 colony-forming units (CFUs)
 - Quat → 22.2 CFUs
2. The proportion of surfaces that yielded no pathogenic growth after cleaning was significantly greater with AHP than with quat ($p<0.0001$):
 - Oxivir Tb → 48% of surfaces yielded zero pathogenic growth
 - Quat → 35% of surfaces yielded zero growth
3. The HAI rate (number of MRSA, VRE and C. difficile infections per 1000 patient days) was significantly better with the AHP group (86) than with the quat group (119):
 - MRSA infections: Oxivir Tb = **21**; Quat = **332**
 - VRE infections: Oxivir Tb = **59**; Quat = **76**
 - C. difficile infections: Oxivir Tb = **6**; Quat + Bleach = **12**

Editorial Comments:

This is the first prospective, cluster-controlled, crossover study to directly compare quat and AHP. This study suggests that AHP disinfectant is more effective than quat disinfectant in reducing bacterial contamination on high-touch surfaces at the point of care. It also suggests that AHP may be more effective than quat in reducing adverse healthcare-related outcomes (HAIs).

This study reflects the findings of Alfa (2015) – that Oxivir Tb wipes, used daily, reduce MRSA, VRE and C. difficile infections. This study is more powerful however, because Alfa used data from a different hospital as a control, did not take environmental cultures, and did not analyse hand hygiene compliance or antimicrobial stewardship.

Bleach is associated with microcracks that harbour pathogens. In this study, the CDI rates in the 2-step quat/bleach arm were double that of the AHP group. That in itself should see astute healthcare professionals questioning the role of quats and even bleach in modern healthcare.

Reference:

Boyce JM, Guercia KA, Sullivan L, Havill NL, Feketi R, Kozakiewicz J, Goffman D.; **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.** American Journal of Infection Control, 2017.