Copper Surfaces Reduce the Microbial Burden in an Out-Patient Infectious Disease Practice


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Abstract

Background: Copper alloy (Cu) surfaces are known to kill bacteria and decrease the environmental microbial bio-burden (MB) in ICUs. Out-patients share risk factors including co-morbidities, antibiotic exposure plus recent hospitalization. The transient and high volume of potentially infectious and vulnerable subjects renders the out-patient clinic a significant locus of transmission that is often overlooked. This study shows the benefit of Cu surfaces for their ability to reduce the MB in an Infectious Disease (ID) out-patient practice (OPP).

Objective: We conducted a pilot study to assess the ability of copper to reduce the MB associated with objects in an out-patient care environment.

Methods: The environmental MB was characterized from 3 therapy chairs in an ID OPP comparing twice weekly MB assessments between standard chairs and those fitted out with Cu. Cu was applied to the side tray and the chair arm tops but not its sides. MB was taken from the surfaces of the chair arms utilizing a pre-moistened sterile rayon/polyester wipe. Samples were sent within 12 hrs in cooled insulated packages and processed within 30 hrs of collection. Quantitative microbiological assessment was conducted using various selective and differential media.

Results: Data from the first 3 weeks of a 9 week study were available for analysis. Average MB per 100 cm2 on the Cu arm-top was reduced from 3668 to 364 (p=0.01). The side tray demonstrated a similar reduction in MB from 1975 to 79 (p=0.01). The MB on the arm-sides, where no Cu was applied, was reduced from 2400 to 1028 (p=0.06). A statistically significant reduction (Kruskal-Wallis Test for two groups) of bacteria, particularly staphylococci, to patients, healthcare workers, and visitors. The MB associated with each object (copper and non-copper) was determined as colony forming units (cfu) per 100cm2. The MB associated with each object (copper and non-copper) was determined as colony forming units (cu) per 100cm2.

Calculations and Statistical Analysis

The MB associated with each object (copper and non-copper) was determined as colony forming units (cfu) per 100cm2. The MB associated with each object (copper and non-copper) was determined as colony forming units (cu) per 100cm2. Patient acquisition of organisms associated with the surface may lead to healthcare-acquired infections in substantial morbidity and mortality.

• The continuous microbiocidal activity of copper was apparent and effective in significantly reducing the total median burden by 90% on the top surface of the arms and by 88% on the trays associated with the chair.

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Conclusions

• The surfaces of regularly cleaned chairs within the phlebotomy area serve as a reservoir for the spread of bacteria, particularly staphylococci, to patients, healthcare workers, and visitors.

References
