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ePoster Viewing

Assessing and decreasing environmental contamination

**COPPER COATED TEXTILES WITH POTENT ANTIMICROBIAL ACTIVITY AGAINST METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS**

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**Objectives:** Copper has been shown to have broad spectrum antimicrobial properties. We evaluated the effects of four different copper-coated textiles on the survival of contemporary methicillin-resistant *Staphylococcus aureus*, which is known to have the inherent capability to survive on dry surfaces over time and is currently endemic in hospitals in many parts of the world.

**Materials and Methods:** Five blood isolates of methicillin-resistant *Staphylococcus aureus* were included in the study. Four different copper-coated textiles samples were evaluated: Samples A and C were Para-aramide (100%), coated with copper with two different methods (coating methods I and II) and samples B and D were Polyester (100%) coated with the same two different coating methods I and II. Plain-uncoated textile samples of Polyester (E) and Para-aramide (F) were used as controls. Coating method I is a well-known and proved copper coating method for both Para-aramide and Polyester, while method II is a new one for both textiles and is to be published soon. To assess their antimicrobial properties, small pieces (1x1cm) were sterilized, inoculated with 10 µl of bacterial suspension (10<sup>8</sup>cfu/ml) and incubated at room temperature for 0, 1h, 3h, 5h and 24 hours. Then pieces were individually placed in sterile phosphate buffer saline and vortexed. The saline was serially diluted and quantitatively cultured for recovery of viable bacteria. The lower limit of detection was 2.6 log<sub>10</sub> cfu/cm<sup>2</sup>. Mean viable counts (log<sub>10</sub> cfu/cm<sup>2</sup>) after incubation at each time interval on each piece were compared for statistical analysis. Reduction of viable counts by >3 log<sub>10</sub> from starting inoculum was characterized as bactericidal activity.

**Results:** *S. aureus* exhibited an immediate reduction of at least 3 log<sub>10</sub> upon inoculation on copper-coated textiles A and C as compared to controls. Viable bacteria could not be recovered from any of the tested strains after contact of 1 hour or more with all copper-coated textiles. Bactericidal activity was documented immediately for textiles A and C and after 1h of contact for textiles B and D. The contact with any of the control textiles did not produce any reduction of inoculum even after 24 hours of incubation.

**Conclusions:** Copper-coated fabrics reduced quickly the number of viable multidrug-resistant *S.aureus* isolates and produced a consistent bactericidal effect. These data suggest that copper – coated textiles may have an important advantage when used in the hospital setting and offer an innovative approach to the reduction of environmental contamination by pathogenic bacteria.