SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The study aimed at comparing the survival rate of VRE on different furniture surface materials (fabric vs. vinyl) after typical environmental disinfection.

DESIGN IMPLICATIONS

Furniture surface material is an environmental factor impacting the risk of surface contamination and infection prevention. Furniture surface materials' ability of resisting contamination and the ease of cleaning are two important criteria in selecting furniture for healthcare settings.

Persistent Contamination of Fabric-Covered Furniture by Vancomycin-Resistant Enterococci: Implications for Upholstery Selection in Hospitals

Noskin, G.A., Bednarz, P., Suriano, T., Reiner, S., Peterson, L.
2000 | American Journal of Infection Control
Volume 28, Issue 4, Pages 311-313

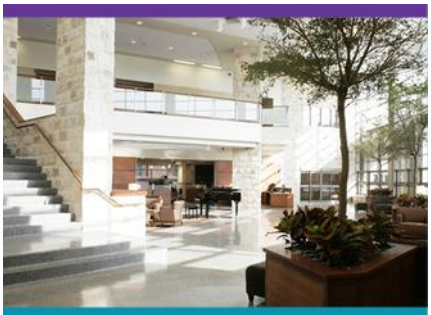
Key Concepts/Context

Vancomycin-resistant enterococci (VRE) are a type of enterococci bacteria resistant to antibiotics especially vancomycin. Enterococci bacteria typically do not cause problems in healthy people but may cause infections (sometimes serious infections) to patients with weakened immune system in body sites such as the intestines, the urinary tract, and wounds. Because of the increasing resistance to antibiotics, VRE infections are much more difficult to treat than other enterococci infections and are becoming a major type of healthcare-associated infections. The main route of VRE transmission is physical contact through person-to-person direct contact, a third person's hands, or inanimate objects commonly found in healthcare settings.

Main methods of preventing VRE infections include handwashing, the use of gloves and gowns, and environmental cleaning to reduce VRE contamination on environmental surfaces near patients. Environmental cleaning's effectiveness in removing VRE may be influenced by the selection of furniture surface materials.

Methods

This study included two main parts. First, microbiologic surveillance was carried out in five randomly selected rooms in a new medical center at a 688-bed acute care hospital. Seat cushions in the five rooms were cultured using impression plates with a size comparable to hand palm and then was incubated to determine VRE contamination. Second, simulated inoculation studies were conducted on two types



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of seat cushion surfaces--a woven synthetic fabric and a vinyl covering (5 samples for each type, tested with or without a protective barrier i.e. linen sheet and bath blanket). After inoculation of a known VRE isolate, the surfaces were cleaned with a quaternary ammonium germicide. In addition, one hand of one staff member touched inoculated surfaces. Cultures were obtained from the seat cushion surfaces and the hand to determine VRE contamination. Molecular typing of genomic DNA was performed to determine association of patients with environmental isolates.

Findings

Positive VRE cultures were obtained from two cushions in one room where a patient with known VRE colonization stayed. Molecular typing indicated a connection between patient colonization and seat cushion contamination. One chair in another room of a patient not colonized with VRE was also contaminated, possibly from previous patients. Routine environmental disinfection with a quaternary ammonium germicide successfully removed VRE from the vinyl seat cushions but not the fabric ones. The hand of the staff was tested positive for VRE after touching the contaminated surfaces. Placing linen sheet or bath blanket over seat cushions only prevented the contamination of cushion surfaces when the sheet was folded in half or quarters (resulting in multiple layers).

Limitations

There were several limitations of this study:

- The study showed the importance of material selection in preventing surface contamination. However, the study focused on only one type of fabric and one type of vinyl therefore the results may not be valid for other fabric and vinyl materials.
- There was only one disinfectant was used to clean both surface materials. It was not clear whether and how a different disinfectant may impact the results.