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Antibiotic and Biocide Resistance in MRSA and VRE

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Suller and Russell from the Welsh School of Pharmacy at Cardiff University highlight concern regarding the potential of antibiotic and disinfectant co-resistance in clinically important bacteria in a study they conducted to determine the comparative susceptibilities of methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-sensitive *S aureus* (MSSA) to chlorhexidine (CHX), the quaternary ammonium compounds (QACs) cetylpyridinium chloride (CPC) and benzalkonium chloride, triclosan, dibromopropamidine isethionate (DBPI), and triclocarban.

MRSA exhibited low-level resistance to CHX and the QACs, with minimum inhibitory concentrations (MICs) of 1.5- to 3-fold (CHX), and 2- to 4-fold (QACs) higher than MSSA. However, the MIC values for MRSA ranged between 0.025 (the MIC of MSSA) and 1 μg/mL with triclosan and between <5 (the MIC of MSSA) and 75 μg/mL with DPBI. Nevertheless, these strains remain relatively sensitive to most of these antimicrobial agents. The bactericidal efficacy of CHX, CPC, and DBPI (with the exception of one strain) correlated with their MIC values. This was not observed using triclosan; MRSA and MSSA strains were equally susceptible to its killing effect, regardless of MIC. The permeabilizing agent, ethylenediamine tetraacetic acid was unable to potentiate the antibacterial activities of the biocides against any of the strains tested. Attempts to select for staphylococcal strains with increased resistance to triclosan, CPC, or CHX, using disk diffusion, step-wise broth, or repeated exposure-and-recovery technique, were only partially successful; resistance was found to be unstable. The susceptibilities of vancomycin-resistant enterococci and vancomycin-sensitive enterococci to the biocides were also compared and found to be similar both in terms of MIC testing and time-kill studies.

FROM: Suller MT, Russell AD. Antibiotic and biocide resistance in methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus. J Hosp Infect* 1999;43: 281-291.