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Inhibition of adherence of coagulase-negative Staphylococci (CoNS) to acrylic by sub-inhibitory concentrations of antibiotics

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CoNS are major nosocomial pathogens associated with infections of indwelling medical devices. The major virulence factor for these organisms is their ability to adhere to devices and form biofilms. Antibiotics interacting with the cell wall may influence bacterial adhesion by causing changes in the cell surface. These cell surface modifications may increase or decrease bacterial adherence to biomaterials. In this study the effect of sub-mic concentrations of cefazolin, vancomycin and dicloxacilin on adhesion to acrylic of several CoNS clinical isolates was determined. The results showed a minimal effect for vancomycin on reducing adhesion, although this antibiotic had a very low MIC value, and thus a high efficiency in killing bacteria in suspension. Cefazolin and dicloxacilin induced a higher inhibition of adhesion, reaching more than 60% for some strains, although being antibiotics that have a lower efficiency of killing bacteria in suspension. Combinations of the drugs were evaluated and a synergistic effect was observed. Use of antibiotics that inhibit adherence of CoNS to biomaterials may augment other treatment strategies for device-related infections.