Adhesion of meticillin-resistant *Staphylococcus aureus* to DACC-coated dressings

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Objective:

The aim of this *in vitro* study was to demonstrate the bacteria binding capacity to dressings coated with dialkyl carbamoyl chloride (DACC) for multiple meticillin-resistant *Staphylococcus aureus* (MRSA) strains and to compare the binding capacity to meticillin-sensitive *Staphylococcus aureus* (MSSA).

Material and methods:

The binding of *Staphylococcus aureus* to a surface was assessed by bioluminescent monitoring of the bacterial ATP levels.

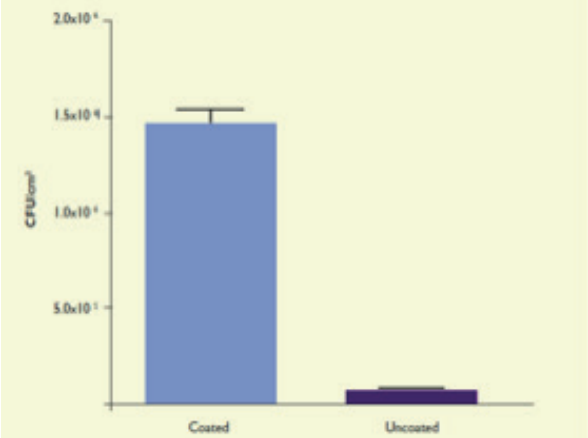
The dressings used in the study consisted of a cellulose acetate-based fabric coated with DACC (Sorbact® Compress). The same uncoated cellulose-acetate fabric was used as a control. All dressings used were sterile.

Eleven *Staphylococcus aureus* isolates were used in the study. In addition to one MSSA control strain there were ten clinically isolated strains (nine MRSA strains and one MSSA strain) obtained from inpatient or outpatient wounds having caused infections needing treatment. All strains were evaluated in relation to their adherence to the DACC-coated dressing and one strain was evaluated also in comparison with the uncoated dressing.

Results:

- The eleven strains of *Staphylococcus aureus* examined all adhered to the DACC-coated dressing (Sorbact®) efficiently and equally. The binding capacity was all in the same range regardless of the antibiotic resistance properties of the specific strain.
- The MSSA control strain bound to the DACC-coated material with a mean 1.5x106 CFU/cm2, whereas for the uncoated material the binding was reduced to a mean of 6.8x104 CFU/cm2, which was significantly lower ($p<0.0001$); see Fig 2.

Fig 2. Adhesion of Staphylococcus aureus to DACC-coated dressing material (n=3) and undcoated control (n=3).



Conclusions:

These findings strengthen the view that development of antibiotic resistance has minimal impact on the surface structures of the microorganisms in wounds.

The demonstrated binding capacity of the evaluated wound pathogens to the DACC-coated dressing was in line with other *in vitro* data earlier reported. So was the significantly lower microbial binding capacity of the uncoated material compared the DACC-coated dressing.

Summary:

The high microbial binding capacity seen with the DACC-coated dressing in this study and by earlier presented data can be expected to decrease wound bioburden of *Staphylococcus aureus* including MRSA. The study results are however not evidence of a clinical effect related to the DACC-coated dressing.