Antibacterial and antifungal effect of polyacrylate superabsorbers

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Introduction
Infection of the wound site can lead to the formation of a chronic wound. Pathogenicity and density of the colonizing microbes influence infection severity. However, when host defense mechanisms are impaired the risk of infection increases. Nosocomial infections have multiplied dramatically in the last years. Important pathogens of nosocomial infections are Staphylococcus aureus, Klebsiella pneumoniae, Pseudomonas aeruginosa, Escherichia coli and Candida albicans. The spread of these pathogens can only be inhibited through consistent hygiene sanctions and preventive disinfectant actions. Polyacrylate-superabsorber containing wound dressings are able to take up large quantities of exudates while keeping the wound environment moist; an additional inhibition of bacterial and fungal growth would be a beneficial attribute. We have tested a polyacrylate-superabsorber containing wound dressing (Vliwasorb®, Lohmann & Rauscher) according to the JIS L 1902 norm, samples of 400 mg of the polyacrylate-superabsorber containing wound dressing (Vliwasorb®, Lohmann & Rauscher) were used for testing. The samples were incubated with the experimental pathogens up to 24h at 37°C under aerobic conditions.

Material & Methods
Staphylococcus aureus, Klebsiella pneumoniae, Pseudomonas aeruginosa, Escherichia coli and Candida albicans were chosen to monitor the antimicrobial effect. According to the JIS L 1902 norm, samples of 400 mg of the polyacrylate-superabsorber containing wound dressing (Vliwasorb®, Lohmann & Rauscher) were used for testing. The samples were incubated with the experimental pathogens up to 24h at 37°C under aerobic conditions.

Results
The polyacrylate-superabsorber containing wound dressings showed a strong inhibitory effect on Klebsiella pneumoniae (fig. 1), Pseudomonas aeruginosa (fig. 2), and Escherichia coli (fig. 3). They were also able to significantly inhibit the growth of Staphylococcus aureus (fig. 4) and Candida albicans (fig. 5).

Conclusions
The polyacrylate-superabsorber containing wound dressing exhibit a distinct antibacterial and antifungal activity. Its use should help to treat wound infections by entrapment of the microorganisms in the forming gel on exudates’ uptake and inhibition of their growth.

References