Assessment of superabsorbent dressings’ activity on biofilm using a novel 3D soft tissue based method

Aim: to qualitatively and quantitatively assess the activity of superabsorbent dressings on biofilm in comparison to one absorbent and one superabsorbent wound dressing claiming hydrophobic antibacterial activity, using a novel in vivo like method.

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Method

- Clinically relevant, since the use of soft tissue allows biofilm formation that closely resembles the biofilm identified in hard to heal wounds.
- Both qualitative and quantitative for rapid screening and numerical values

Assessment
- Zone of inhibition (ZOI)
- Bacterial burden in dressings and SST
Results

• DME with a silver net (DME-Ag) showed a distinct ZOI and no onset of Pyocyanin (green pigment and virulence factor).
• DME showed partial ZOI and partial onset of Pyocyanin.
• SSS (benchmark 1) was equivalent to DME but more green.
• SB (benchmark 2) showed partial ZOI and onset of Pyocyanin equivalent with bacterial biofilm control.
• The bacterial burden in the tissue and in respective dressings was equal for all, except for DME-Ag resulting in a log 4 reduction.

DME = DryMax® Extra, DME-Ag = with silver net, SSS* = Sorbion Sachet S, SB* = Sorbact®, BC = bacterial control, SC = sterility control
*= benchmark product
Results

- Complete ZOI was seen for all SAP dressings (DME, DME-Ag, SSS) without inserts
- No ZOI was seen for SB

DME = DryMax® Extra, DME-Ag = with silver net, SSS* = Sorbion Sachet S, SB* = Sorbact®, BC = bacterial control, SC = sterility control
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Conclusion

- DryMax® Extra, a superabsorbent dressing, removes bacteria from synthetic soft tissue equally well as Sorbact® and Sorbion Sachet S that claim antibacterial activity.

- To obtain log reduction in bacterial load an antimicrobial substance must be added.

- DryMax® Extra showed partial ZOI and less green color than Sorbion Sachet S while Sorbact® was very green and equal to the bacterial biofilm control.

- The Green color most likely correlates to the virulence factor Pyocyanin of Pseudomonas aeruginosa. Pyocyanin has been reported to play an essential role for formation of biofilm and other virulence factors.

- DryMax® Extra possibly offers a New strategy for wound therapy By targeting the virulence factor Pyocyanin, thus rendering the pathogens unarmed with less risk of infection and development of antibiotic resistance.