

Antimicrobial activity of silver containing, activated charcoal dressing – Vliwaktiv® Ag

Weber U¹, Gorka M-Th², Abel M², Kramer A¹

² Martin.Abel@de.LRmed.com

¹ Hygiene Nord GmbH, c/o BioTechnikum, 17489 Greifswald, Germany

² Lohmann & Rauscher GmbH & Co. KG, 56579 Rengsdorf, Germany

Introduction:

The bactericidal properties of silver ions have led over the years to the development of several silver-containing dressings. The purpose of this study was to investigate the antimicrobial efficacy against common wound pathogens of Vliwaktiv® Ag, a dressing with an activated charcoal inner layer and incorporated antimicrobial low-releasing silver-fibers (1).

Material and Methods

The dressings (inoculated in test organism-suspension containing approx. 1.0×10^6 cfu/ml) were incubated up to 72 h at $36 \pm 1^\circ\text{C}$ ($30 \pm 1^\circ\text{C}$ for *C. albicans*). The lg reduction was calculated by subtracting the lg transformed counts of original viable bacteria ($t = 0$) from the lg transformed counts of viable bacteria in silver containing assays at defined time points ($t = 3, 24, 48, 72\text{h}$) (2, 3).

Test organisms: *E. faecium* (ATCC 6057), *P. aeruginosa* (ATCC 15442), *C. albicans* (ATCC 10231), MRSA (Epidemiestamm Nord), VR *E. faecium*

Purpose

Vliwaktiv® Ag is consistently effective against common wound pathogens. Vliwaktiv® Ag is already able to reduce the cfu noticeable after three hours contact time. Vliwaktiv® Ag showed excellent bactericidal* activities of at least 3 lg against *E. faecium* and *P. aeruginosa* within 24 hours. After 48 h a high efficacy was assessed against clinically important pathogens like MRSA and VRE. Comparable results were evaluated for Actisorb® Silver 220 (positive control).

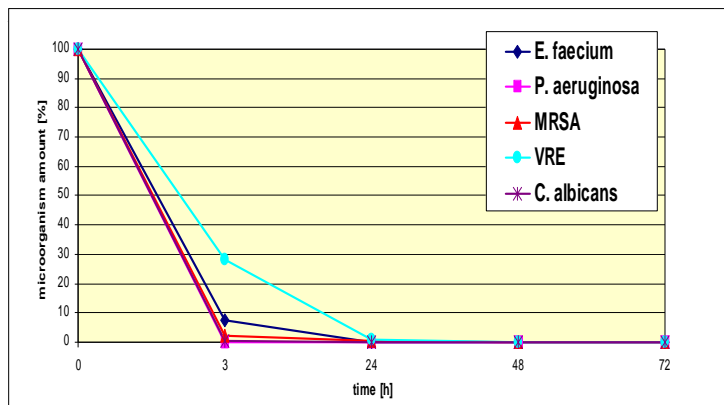


Fig. 1: Detectable microorganisms after exposure to silver-impregnated activated charcoal dressing Vliwaktiv® Ag

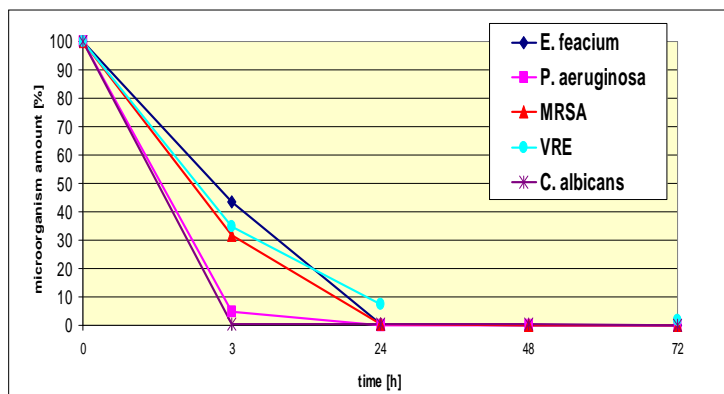


Fig. 2: Detectable microorganisms after exposure to silver-containing activated charcoal dressing Actisorb® Silver 220 (positive control)

lg reduction factors [cfu/ml]					
Time	<i>E. faecium</i>	<i>P. aeruginosa</i>	MRSA	VRE	<i>C. albicans</i>
Vliwaktiv® Ag (L&R)					
0 h	0	0	0	0	0
3 h	1,13	3,22	1,68	0,55	1,48
24 h	3,82	3,76	2,46	2	2,62
48 h	3,27	3,62	5,09	3,08	2,87
72 h	4,47	3,46	5,17	4,91	2,76
Actisorb Silver® 220 (J&J)					
0 h	0	0	0	0	0
3 h	0,36	1,33	0,5	0,46	2,53
24 h	2,62	5,47	2,4	1,14	2,65
48 h	3,47	5,47	3,24	0,31	2,65
72 h	3,95	4,27	3,82	1,81	3,11

Tab. 1:

Antimicrobial activity (lg reduction factors of cfu/ml) of the two silver containing samples against five different microorganisms throughout a period of three days.

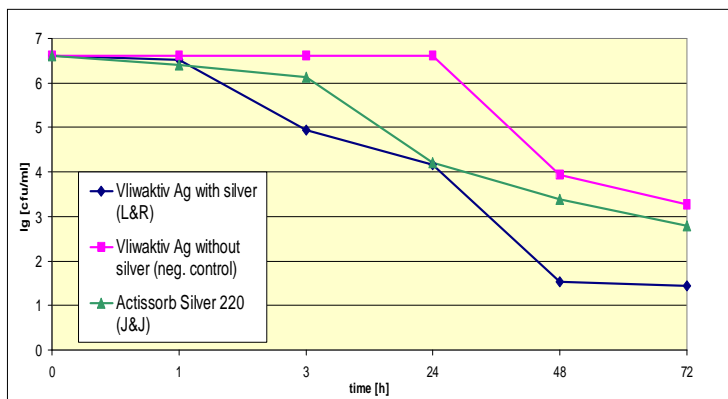


Fig. 3:

The antimicrobial efficacy of silver-containing activated charcoal dressings Vliwaktiv® Ag and Actisorb® Silver 220 (positive control) in comparison to the silver free Vliwaktiv® Ag (negative control) against *P. aeruginosa*.

Discussion:

The silver-impregnated activated charcoal dressing Vliwaktiv® Ag demonstrated antimicrobial activity against all test organisms. The challenge test results show the efficacy of Vliwaktiv® Ag also against problematic pathogens like MRSA and VRE.

Concluding Vliwaktiv® Ag is able to provide a sustained low but efficacious dose of ionic silver within the dressing (1).

The mean value of lg reduction obtained for Vliwaktiv® Ag is comparable with the antimicrobial performance reached by the reference product Actisorb® Silver 220 (J&J).

References

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- Pitten FA, Werner HP, Kramer A (2003): A standardized test to assess the impact of different organic challenges on the antimicrobial activity of antiseptics. In: Journal of Hospital Infection. 55: 108-115

* In accordance with NCCLS, Wayne, PA 19087, USA or DIN 58940