This poster was presented at the 23rd EADV Congress in October 2014, Amsterdam, The Netherlands.

Infected wounds – *in vitro* activity of topical antiseptic products against *P. aeruginosa*

Gallagher J. and Rosher P.

Research and Development Department, Dermal Laboratories, Hitchin, UK

DERMAL
TOPICAL INNOVATION

Introduction

Infected wounds are defined as wounds in which bacteria or other microorganisms have colonised the lesion, causing either a delay in wound healing or deterioration of the wound. One of the most common causative organisms associated with wound infections is *Pseudomonas aeruginosa*.

The aim of this study was to investigate *in vitro* activity of two commercially available antiseptic products, Dermol Lotion™ (DERL) and Dermol Cream™ (DERC), against two strains of clinical isolates of *P. aeruginosa*, obtained from secondary infections.

DERL and DERC are dermatologically 'friendly' products containing chlorhexidine dihydrochloride and benzalkonium chloride, each at the low level of 0.1%.

Materials and Methods

- The clinical isolates, *P. aeruginosa* NCTC 1999 and *P. aeruginosa* NCTC 5083, were grown at 37°C for 18-24 hours on Tryptone Soya Agar and a suspension of approximately 1.0 x 10^8 cfu/ml was prepared in Maximum Recovery Diluent for each strain.
- In triplicate, to 10ml of each product, 0.1ml of strain suspension was added and mixed. 1ml samples of the mixture were removed immediately (time zero) and after 5, 10, 20 and 30 mins and added to 9 ml of universal inactivation liquid.
- Further dilutions were prepared as required for counting and poured onto Tryptone Soya Agar plates.
- The plates were incubated at 30°C for 72h and the numbers of colonies counted and expressed as cfu/ml. If no counts were observed, a <10 count was recorded.
- For the validation test, also in triplicate, a suspension of approximately 1.0 x 10^4 cfu/ml was prepared in Maximum Recovery Diluent for each *P. aeruginosa* strain. 1ml of each product was diluted 10 and 100 fold in universal inactivation liquid followed by the addition of microbial suspension to give a final organism concentration of 1.0 x 10^2 cfu/ml. 10 ml of universal inactivation liquid was treated in the same way to act as a control. 1 ml of each of the suspensions were plated in petri dishes poured with Tryptone Soya Agar. The plates were incubated at 30°C for 72h and the numbers of colonies counted and expressed as cfu/ml. If no counts were observed, a <10 count was recorded.

Results

- Validation tests confirmed that the universal inactivation liquid inactivated residual product in the growth medium (Table 1).

Table 1. Validation results (cfu/ml)

	Product					
	DERL		DERC			
Organism	10 fold dilution	100 fold dilution	10 fold dilution	100 fold dilution	**Control Count**	**Valid**
P. aeruginosa NCTC 1999	80	74	90	94	86	At both sample dilutions for both products
P. aeruginosa NCTC 5083	141	148	149	140	145	At both sample dilutions for both products

- Both DERL and DERC achieved at least 2 log reductions at time zero and no counts were seen after 5 minutes onwards (Tables 2 and 3).

Table 2. Test results for Dermol Lotion

	DERL					
	Microbial count (cfu/ml) at each time point					
Organism	Initial inoculum	0 min	5 min	10 min	20 min	30 min
P. aeruginosa NCTC 1999	9.5 x 10^5	4.0 x 10^3	<10	<10	<10	<10
P. aeruginosa NCTC 5083	8.7 x 10^5	3.0 x 10^1	<10	<10	<10	<10

Table 3. Test results for Dermol Cream

	DERC					
	Microbial count (cfu/ml) at each time point					
Organism	Initial inoculum	0 min	5 min	10 min	20 min	30 min
P. aeruginosa NCTC 1999	9.5 x 10^5	<10	<10	<10	<10	<10
P. aeruginosa NCTC 5083	8.7 x 10^5	2.4 x 10^2	<10	<10	<10	<10

Conclusion

Tested *in vitro*, topical antiseptic formulations Dermol Lotion and Dermol Cream exhibit rapid activity against *P. aeruginosa.*

Please turn over for poster summary.

Dermol Lotion and Dermol Cream demonstrate rapid *in vitro* activity against *Pseudomonas aeruginosa*

Pseudomonas aeruginosa (P. aeruginosa) is an opportunist pathogen that can cause a range of infections in susceptible people, including those of the skin and wounds. Infected wounds, in which bacteria or other microorganisms have colonised the lesion, often result in delayed healing or deterioration of the wound.

Dermol Lotion and Dermol Cream are topical antimicrobial emollients and soap substitutes formulated to be 'dermatologically friendly'. Both products contain two antiseptics, chlorhexidine dihydrochloride and benzalkonium chloride, that work synergistically and so are present at the low but effective level of 0.1% each, to minimise the risk of skin irritancy. Dermol Lotion and Dermol Cream can be applied directly to the skin or, as they contain a non-ionic cleansing agent, they can be used as soap substitutes for washing and cleansing.

The study summarised overleaf shows that, tested *in vitro*, Dermol Lotion and Dermol Cream exhibit rapid activity against *P. aeruginosa*.

Summary of Poster Overleaf:

- Suspensions of two strains of clinical isolates of *P. aeruginosa* obtained from secondary infections were prepared containing 1.0×10^8 colony forming units/ml (cfu/ml).
- Samples of Dermol Lotion and Dermol Cream (10ml) were inoculated with 0.1ml of the *P. aeruginosa* suspension. One ml samples of the mixture were removed and then inactivated after differing periods of time (0, 5, 10, 20 and 30 mins) and incubated anaerobically at 30°C for 72 hours on growth medium plates.
- After incubation, the number of colonies on each plate were counted and expressed as cfu/ml. If no counts were observed, a <10 count was recorded.
- Both Dermol Lotion and Dermol Cream achieved at least 2 log reductions at time zero and no counts were seen from 5 minutes onwards.

Conclusion:

Tested *in vitro*, topical antiseptic formulations Dermol Lotion and Dermol Cream exhibit rapid activity against *P. aeruginosa.*

Dermol® 500 Lotion

Benzalkonium chloride 0.1% w/w, chlorhexidine dihydrochloride 0.1% w/w, liquid paraffin 2.5% w/w, isopropyl myristate 2.5% w/w.

Dermol® Cream

Benzalkonium chloride 0.1% w/w, chlorhexidine dihydrochloride 0.1% w/w, liquid paraffin 10% w/w, isopropyl myristate 10% w/w.

Adverse events should be reported. Reporting forms and information can be found at yellowcard.mhra.gov.uk. Adverse events should also be reported to Dermal.

Click **here** for the Dermol Range Prescribing Information or scan the QR code below

'Dermol' is a registered trademark

DERMAL
TOPICAL INNOVATION
www.dermal.co.uk

Further information is available from:
Dermal Laboratories Limited, Tatmore Place, Gosmore, Hitchin, Herts SG4 7QR

DEMPR172/JAN25