EVALUATION OF THE DECONTAMINATING ACTIVITY OF DIPHOTERINE(R)

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Diphoterine is coded under the name X32

I. DECONTAMINATION OF SULFUR MUSTARD (YPERITE)

Materials and Methods

Sulfur mustard is bound to the epidermal corneal layer; about 70% of sulfur mustard deposited on the skin is retained in this layer.

Skin fragments prepared according to a previously described method (1,2) were exposed to carbon(14)-labelled sulfur mustard. The sulfur mustard was in a methylene chloride solution and its specific activity was 1.66 GBq/mmol (C.E.N. SACLAY - Molecules Marques [labelled molecules] 91191 GIF sur YVETTE, France).

After 5 minutes of exposure, the skin fragments were immersed in a decontamination fluid.

We utilized three decontamination protocols:

- 3 Minutes of decontamination;
- 10 Minutes of decontamination;
- Three successive decontaminations of 10 minutes each which is recommended for radioactive decontamination (3).

3 decontamination fluids were utilized:

- water and soap (diluted by 1/500 so as not to emulsify the skin fragments);
- physiologic saline;
- DIPHOTERINE X32.

The study methodology has been previously described (3).

Results and Discussion

Diphoterine X32 is shown to be more efficacious than the decontamination fluids currently utilized (water and soap, physiologic saline).

It required 3 decontaminations to eliminate an appreciable quantity of labelled sulfur mustard or its degradation products: this is in effect a study of the displacement of radioactivity and not a study of the detoxification of the compound.

Type of Decontamination	Residual Activity of the Skin Fragments after Decontamination as a % of the Initial Deposited Activity (mean +/- SEM)		
	Water and Soap	Physiologic Saline	Diphoterine X32
3 Minute Decontamination	0.65 +/- 0.19	0.81 +/- 0.18	3.19 +/- 1.05
10 Minute Decontamination	2.33 +/- 1.04	5.83 +/- 0.45	13.41 +/- 0.31*
Three 10 Minute Decontaminations	37.2 +/- 2.6	32.1 +/- 0.6	50.0 +/- 3.6*

*** Significant difference in comparison with water and soap at $p > 0.95$**

1) Wepierre J, Marty J: Sci Techn Pharm 1979; 8:171-172.
2) Gerasimo P et al: Ann Pharmaceutiques France 1997; 55:116-124.
3) Bhattacharyya MH et al: Radiat Protect Dos 1992; 41:27-36.