L. Mathieu[(1)], AH Hall[(2)], J. Nehles[(3)], J.M. Barbe[(4)] , J Blomet[(1)]

[(1)] Laboratoire PREVOR,Valmondois, France (http://www.prevor.com);
[(2)]Department of Emergency Medicine, Division of Toxicology, Texas Tech University Heath Sciences Center-El Paso, El Paso, TX, USA and TCMTS, Inc., 3456 Oxcart Run Street, El Paso, TX, 79936, USA; [(3)]Mannesman, Remscheid, Germany ; [(4)]Cristalleries d'Arques, Arques, France

EYE AND SKIN HYDROFLUORIC ACID SPLASHES : ABOUT 32 CASES RINSED WITH HEXAFLUORINE®

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Introduction

Hexafluorine® is a first aid emergency rinsing solution for eye and skin splashes due to hydrofluoric acid[1,2,3] (HF). It can, thanks to its chelating and hypertonic properties, stop simultaneously the acidity and the toxic action of fluoride ions and avoid their penetration[4].

Methods

A review of all cases of hydrofluoric acid eye and skin splashes that happened in the industry and that were initially rinsed with Hexafluorine®.

Results

32 cases of eye or skin splashes due to hydrofluoric acid were rinsed with Hexafluorine® as first aid rinsing solution.

ISOLATED CASES

Year	Nb of cases	Company/Country	Splash due to	Involved body area	Type of rinsing	Consequence
1997	1	Woeste Germany	HF/HCl* bath	Complete Immersion	**Hexafluorine® on the body, ***Water Eyewash	**Light burns on the abdomen and the back ***Serious burn on the left eye
1996	1	Cristalleries d'Arques France	HF 70% vapour	Right cheek	Hexafluorine®	Light and non painful erythema. Application of a calcium gluconate gel on the day after, no loss of work
1996	1	Krupp Germany	HF 38%	One eye	Hexafluorine®	No burn, no loss of work
1993	2	Alcan Germany	HF 5%	Body	Hexafluorine®	No burn, no loss of work

- 30 litres of 31/33% hydrochloric acid and 233 litres of 59% hydrofluoric acid in 1505 litres of water

SERIE OF 11 CASES IN MANNESMANN (Remscheid, Germany) from 1994 to 1998

Splash with	**40% HF**	6% HF / 15% HNO_3	**40% HF**	6% HF / 15% HNO_3
Number of cases	**1**	1	**5**	5
% involved surface	**2 eyes***	1 eye	**0.2 – 1 – 4.5 – 4.5 – 16.5***	0.2 – 2.25 –4 –4.5 - 10.5
First rinsing	**Hexafluorine®**	Hexafluorine®	**Hexafluorine®**	Hexafluorine®
Second rinsing	**Hexafluorine®**	Hexafluorine®	**Hexafluorine®**	Hexafluorine®

* both eye and skin splash due to 40% HF

RESULTS : There were no after effects, neither secondary care nor losses of work were necessary for all these hydrofluoric acid splashes rinsed in emergency with Hexafluorine®

SERIE OF 16 CASES IN AVESTA (several plants, Sweden) from 1998 to 1999

Nb of cases	Splashes due to	Involved body surface	Time of contact	Loss of work
2	**70% HF**	**Left Forearm – oral cavity**	**< 1 min**	**0-1**
1	HF (unknown concentration)	One eye	< 1 min	0
2	HF/HNO_3 pH=1	One eye	< 1 min	0-0
1	HF/HNO_3 pH=1*	One eye	3-5 min	3
1	HF/HNO_3 pH=1	Two eyes	< 1 min	0
1	HF/HNO_3 pH=1	One thigh	< 1 min	0
2	HF/HNO_3 pH=1	Two thighs	1h - 1h30	2 –2
1	HF/HNO_3 pH=1*	Face	3-5 min	3
2	HF/HNO_3 pH=1	Face + oral cavity - Forehead	< 1 min	1-1
3	HF/HNO_3 pH=1	Forearm – Arm + hand – Two elbows	< 1 min	0-0-1
1	HF/HNO_3 pH=1	Wrists	2 h	0

*HF/HNO_3/H_2SO_4 pH = 1 represents one single eye and skin splash

RESULTS : Immediate pain relief, no after effects. In 75% of the cases, including both 70% HF splashes, no secondary were reported and the average of days lost from work is inferior to 1 day (σ = 1.1)

All 32 splashes due to hydrofluoric acid were rinsed with l'Hexafluorine® as first aid rinsing solution No serious burnwas noted in any case. It was not necessary to have any prolonged and intensive secondary care.

Conclusion

The first aid rinsing with Hexafluorine® allowed to stop the appearance of the burndue to hydrofluoric acid or to decrease strongly its seriousness.

References

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