

A review about Diphotérine®, the solution for emergency decontamination of chemical splashes

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Introduction : The diverse range of chemicals currently being used throughout industry present a significant potential hazard to health(1) when personnel become contaminated as a result of accidental splashes(2). The need to use a polyvalent and active rinsing solution becomes more and more necessary.

Materials and methods : Diphotérine® is an emergency first aid rinsing solution for eye/skin chemical splashes. Using its hypertonicity(3) and its chemical properties(4), Diphotérine® is able to stop and absorb the aggressiveness of a wide spectrum of chemicals and remove them from the tissues. Diphotérine® is a non toxic(5) solution (Oral Toxicity LD₅₀>2000 mg/Kg, Test 6564 TAR 1990 CIT, France; Acute Dermal Toxicity LD₅₀>2000 mg/Kg, test 133/9, 1988, Safepharm Laboratories, UK). It is slightly irritant on the skin and non irritant in the eye (test 133/3-133/4, 1987, Safepharm Laboratories, UK). Its residues with acids and bases are non irritant (test 6463TAL/6462TAL, 1990, CIT, France). The environmental effects of Diphotérine® have been studied and it was found non toxic by Microtoxicity (CE₅₀-15 minutes>5000 mg/l, CE₅₀-30 minutes>5000 mg/l) and Aquatic Toxicity (on Daphnia Magna, CE₅₀-24h>5000 mg/l) (tests n°D9811\0611, 1998, SGS Crépin Laboratory, France). Diphotérine® is a medical device CE 0459, first classifying and sterile. Most of the companies mentioned in this report, were previously using water for emergency first aid decontamination of eye/skin chemical splashes without complete success : irremediable sequelae, numerous secondary care and loss of work. Subsequently, the Medical and Health and Safety Services decided to introduce Diphotérine® (or Previn®) for rinsing chemical splashes and to train workers to use it correctly. Previn® is the German version of Diphotérine®. Each ocular or cutaneous chemical splash was rinsed in emergency (some seconds to a few minutes) with Diphotérine®, on location, while undressing if necessary. Then each person went to the medical centre for an examination. In the MANNESMANN company, a secondary rinsing with Diphotérine® was performed in the medical centre.

Results : 1) a serie(6) of 24 chemical splashes in the MANNESMANN factory, in Germany, from 1994 to 1998 was rinsed with Diphotérine®. No damage, no secondary care, no loss of work excepted two accidents with one day lost from time. 2) The results about on 652 cases (7) rinsed with Diphotérine® versus water were collected in the ATOFINA factory, in France, from 1992 to 2000. The preliminary results were analysed on the 379 cases due to main products (acrylic acid, acrylates, sodium hydroxide, sulfuric acid, ADAME). The analysis of two criterion "no after effect" (simple registration in the infirmary without any care) and "loss of work" showed that there was a significant difference (p<0.05) in favour of the efficacy of rinsing with Diphotérine® versus water. 3) A statistical study(6) about 42 sodium hydroxide (40-600 g/l) splashes rinsed with different rinsing solutions, in the MARTINSWERK factory, Germany, from 1991-1993, showed that the rinsing with Diphotérine® was significantly (p<0.05) more secured than the rinsing with other solutions. It was expressed by an important decrease of loss of work and no need of secondary care. 4) A statistical study(6) about 195 chemical accidents was performed in the Rhône-poulenc factory, France, from 1987 to 1996. Two major accidents rinsed with water happened with big sequels for workers. Diphotérine® was introduced in 1989 and until the end of the study no accident with sequels were observed. Using Diphotérine® instead of water completely suppressed loss of work and significantly reduced the need for secondary care.

Conclusion : The emergency use of Diphotérine® is a good way for the decontamination of ocular or cutaneous chemical splashes. Its emergent use often gives an immediate pain relief. It achieves a reduction of loss of work and secondary care in all cases and avoids sequels for the workers.

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