toxtidbits
the maryland poison center's monthly update. news. advances. information.
1-800-222-1222
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Hydrofluoric Acid

Hydrofluoric (HF) acid has been used for centuries in industry for glass etching and brick and metal cleaning. More recently it has been used for electroplating and etching microchips. This strong inorganic acid is even found in household products for rust removal and porcelain cleaning. In 2005 there were 920 exposures reported to U.S. poison centers, with 893 being unintentional. Many are related to occupational accidents with the majority of patients 19 years of age and older. Most cases involve exposure to the hands, usually on the fingers.

HF acid penetrates deeply into tissues where it dissociates into a hydrogen ion and a highly electronegative fluoride ion. The reactive fluoride ion binds to calcium and magnesium stores causing a precipitous drop in both electrolytes. In addition, the free hydrogen ions can cause corrosive burns. Dilute solutions penetrate deeply before dissociating, leading to delayed injury and symptoms, whereas concentrated solutions cause immediate injury. One characteristic unique to HF acid burns is that the pain and symptoms may be severe in relation to a perceived lack of skin abnormalities.

Symptoms are related to the concentration of the HF acid and the body surface area affected. Local effects can include pain, erythema, blisters, and necrosis. HF acid can cause profound systemic effects, especially with higher concentration solutions of ≥ 50%. Hypomagnesemia and hypocalcemia are most prominent. Tetany, QTc prolongation, and cardiac arrest quickly ensue if not treated immediately. Inhalation exposure from dermal burns can cause respiratory distress.

General management should include thorough decontamination including removal of all clothes and showering with copious amounts of water. Airway assessment, cardiac monitoring, and electrolyte measurement are critical. Minor dermal burns can be treated with 2.5% calcium gluconate gel. To treat a finger burn, add the gel to a latex or nitrile glove in the affected digit and have the patient wear the glove. This should help alleviate some of the pain and prevent further fluoride toxicity. Subcutaneous or intraarterial calcium gluconate can be used to treat more serious exposures. Systemic toxicity should be treated with IV calcium gluconate and magnesium sulfate.

As always, please contact the Maryland Poison Center at **1-800-222-1222** to assist you in the management of hydrofluoric acid exposures.

Bryan D. Hayes, PharmD, Clinical Toxicology Fellow

DID YOU KNOW THAT… *poison centers are reporting many ingestions of Fabuloso cleaner?*

The packaging of this multi-purpose cleaner has resulted in confusing the product with a sports drink or water bottle. Ingestions usually result in minor gastrointestinal symptoms. The manufacturer has recently begun putting child-resistant closures on the product to serve as a visual cue that it is not to be consumed.

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