Cutaneous Cyclohexylamine Exposure Resulting in Significant Dermal Burns without Systemic Toxicity

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Introduction

- Cyclohexylamine is a common aliphatic amine used as a corrosive inhibitor and chemical intermediate in the manufacturing of insecticides, plasticizers, and emulsifying agents.
- There are no reports of significant human cutaneous exposure published.
- This case highlights significant partial thickness dermal burns following extensive cutaneous exposure to the liquid corrosive cyclohexylamine, without development of systemic toxicity.

Physical Examination

| Blood pressure: 141/93 mmHg |
| Resp: 18 breaths per minute |
| Temperature: 96.8 Fahrenheit |
| O₂: 100 % on Room Air |

- 14% partial thickness burns diffuse erythema, hyperpigmentation, blistering, and desquamation located bilaterally across the upper extremities, face, and chest.
- Sites of exposure were painful to touch with blanching.
- No signs of throat irritation, hoarseness, respiratory distress, chest discomfort, eye irritation, or altered mental status.

Outcome

- He was treated with intravenous fluids, morphine for pain control, and was admitted for observation to a burn center with typical burn wound treatment.
- He was discharged the following day with the diagnosis of cyclohexylamine-induced partial thickness chemical burns.
- At one week follow-up, his pain had improved and partial re-epithelialization of burned areas was noted without signs of infection or soft tissue loss.
- At no time during his medical course were there signs of central nervous system depression or other neurologic sequelae following this exposure.

Presentation

- A previously healthy 50 year-old male was transferring liquid cyclohexylamine between two containers at work.
- While transferring, he wore a full-face respirator, short-sleeved shirt, and pants.
- Overfilling the container caused cyclohexylamine to splash across his upper body and face resulting in an immediate burning sensation.
- Decontamination was performed for 30 seconds, during which time he reported tasting the chemical.

Results

- sodium 138 mmol/L, potassium 4.0 mmol/L, chloride 105 mmol/L, carbon dioxide 21 mmol/L, BUN 18 mg/dL, creatinine 0.9 mg/dL, glucose 80 mg/dL, calcium 9.2 mg/dL, alk phos 61 U/L, AST 27 U/L, ALT 20 U/L
- WBC 7.41 k/uL, hemoglobin 14.8 g/dL, hematocrit 41.6 %, platelets 184 k/uL
- Chest radiograph: no evidence of pneumonia, pneumothorax, pulmonary edema, or other acute cardiopulmonary disease process.

Conclusions

- Cutaneous exposure to cyclohexylamine liquid can cause significant dermal burns without the development of systemic toxicity.

[Chemical structure of cyclohexylamine]