Assessment of Chemical Exposures: The Role of Public Health

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DIVISION OF ENVIRONMENTAL AND OCCUPATIONAL DISEASE CONTROL
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
Division of Environmental and Occupational Disease Control (DEODC)

- Occupational Health Branch
- Environmental Health Investigation Branch
- Childhood Lead Poisoning Prevention Branch
- Environmental Health Laboratory Branch
Emergency Planning and Preparedness Team

- Mobilizes and directs DEODC’s occupational, environmental, and laboratory expertise to anticipate, prepare for, and respond to events and to evaluate the quality of the response to those events.

- Integrates the DEODC response into the Incident Command Structure (ICS), the Standardized Emergency Management System (SEMS), and the National Incident Management System (NIMS), as appropriate.

- Works with local, state, and federal agencies and other partners to identify and reduce risks from chemical and hazardous incidents.
EPP Team activities and resources

- 24/7 Duty Officer for hazardous materials spills/releases
- Surveillance of spills/releases
- Technical assistance to local public and environmental health
- Public health assessment following chemical releases
- Emergency Mobile Laboratory (EML)
- All Hazards Risk Assessment Laboratory (AHRAL),
How DEODC is notified

- Concerned citizen
- Medical professional
- Local Environmental Health or Public Health
- Other CDPH Duty Officers
- Local, State or Federal agency (e.g., health, law enforcement, hazmat, National Response Center)

CDPH Duty Officer (Emergency Preparedness Office)

DEODC Duty Officer
Public health investigations of chemical releases: Chlorine
Investigation

- **Objectives**
  - Describe characteristics of individuals exposed during chlorine gas release
  - Assess health effects associated with exposure
  - Develop recommendations for preventing similar incident in future

- **Assessment of Chemical Exposures (ACE) questionnaire (ATSDR)**
  - English and Spanish
  - Exposure, health effects, evacuation, decontamination, medical care

- **Key informant interviews**
  - Responders
  - Facility owners

- **Medical chart abstraction (23)**

- **6-month follow-up**
  - Interviews
  - Medical record review
Findings

- Exposure during evacuation
- Delayed decontamination
- Majority experienced mild symptoms, but a few experienced severe health effects
- No signification association between exposure characteristics and hospitalization
- Respiratory and mental health symptoms persisted in many exposed individuals 6 months later
Public health activities

- Prevention recommendations developed and disseminated
  - Recommendations to facility
    - Modify evacuation and emergency plans
    - Educate employees
  - State-wide chemical release alert
- Recommendations to providers
  - Evaluate for long-term health consequences (e.g. RADs, PTSD)
Chemical Release Alert
August 2010

Prevention Points

- Only accept containers that are cut open, dry, and without a valve or plug.
- Treat closed containers as potential hazardous waste.
- Develop and practice an evacuation plan. Train workers to stay upwind when evacuating for a chemical release.

The Division of Environmental and Occupational Disease Control (DEODC) Emergency Planning and Preparedness (EPP) Team tracks and investigates cases of chemical and other hazardous materials releases and makes prevention recommendations for employers, employees, and other affected individuals. In the past 6 months, the EPP Team, in collaboration with the Agency for Toxic Substances and Disease Registry (ATSDR) and the Centers for Disease Control and Prevention (CDC), has investigated two releases of chlorine gas from closed cylinders brought to scrap metal recycling facilities. In both of these incidents, the recycling facilities accepted the cylinders for processing but were not aware that they contained chlorine gas.

In the first incident, chlorine gas was released when a one-ton gas cylinder was being moved and was punctured by a crane. Five workers were hospitalized with respiratory problems after they breathed the chlorine gas. In the second incident, chlorine gas was released when a one-ton gas cylinder was crushed by a shearing machine. Several workers evacuated in the downwind direction in the path of the chlorine cloud. Twenty-three workers and nearby residents were treated at the emergency room and six were hospitalized with respiratory problems.

As an immediate step to prevent future incidents, scrap recycling facilities should only accept containers that are cut open, dry, and do not have a valve or plug. If a closed container is found, it should be treated as if it contains hazardous material. Closed containers should be moved using a cylinder cart or basket and stored upright in an isolated, well-ventilated area protected from flames, oil, grease, sun, and heat. The employer should contact a local HazMat team or a company specializing in handling hazardous materials to have the container removed. Employers should also develop and practice an evacuation plan and train workers to stay upwind when evacuating for a chemical release.
Chlorine Gas Exposure at a Metal Recycling Facility — California, 2010

Reported by

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Accidental mixing of acid and bleach in laundry facility at a large hotel

Hotel evacuated

Approximately 30 individuals transported to the hospital

Ongoing investigation of incident
Public health investigations: Mercury poisoning from skin creams
Incident

- Mexican-American family participated in a health study, 4 family members had elevated Hg in blood
- US EPA inspection and decontamination
  - Index family home: Air levels elevated but evacuation not necessary
  - Home of mother’s client: No elevated levels
- No mercury source identified
CDPH Investigation

- County requested DEODC assistance
- DEODC staff interviewed family in Spanish
  - Index case used homemade, unlabeled skin cream from Mexico for removing age spots and freckles twice daily for ~3 years
    - Husband used cream once daily
    - Children likely had secondary exposure
  - Relatives in Virginia using same cream
- Cream analyzed by CDPH Food and Drug Laboratory Branch
Findings

- **Source identified: homemade, unlabeled skin cream from Mexico**
  - 56,000 ppm (5.6%) Hg (US FDA allows only < 1 ppm Hg in face cream products )
- **Worked with VA Department of Public Health, confirmed related exposures in Virginia**
- **Texas and New York also recently found mercury in creams made in Mexico and the Dominican Republic**
Public health prevention activities

- Collaboration with partners
- Development and dissemination of health materials
  - Health alert for clinicians
  - Fact sheet for individuals
  - Public service announcement
  - Morbidity and Mortality Weekly Report
  - Newspaper articles
  - Television interview
- Follow-up cream collection and testing project underway
Health Alert

Mercury Poisoning Linked to Use of Face Lightening Cream

The California Department of Public Health (CDPH) is investigating several cases of mercury poisoning due to an unlabeled face cream from Mexico used for lightening the skin, fading freckles and age spots, and treating acne. The cream contained very high levels of mercury: 56,000 parts per million (ppm) or 5.6%. The U.S. Food and Drug Administration allows only trace levels of mercury (less than 1 ppm) in face cream products.

Signs and symptoms of mild to moderate toxicity due to inorganic mercury may include nervousness and irritability, difficulty with concentration, headache, tremors, memory loss, depression, insomnia, weight loss, and fatigue. Other symptoms may include numbness or tingling in hands, feet, or around the lips. Renal effects include proteinuria, nephrotic syndrome, and renal tubular acidosis. Gingivitis and excessive salivation may also occur. In children, prolonged exposure to inorganic mercury may also cause acrodynia, irritability, anorexia, and poor muscle tone.
Warning: Mercury in Home Made Face Creams

In the past few months, several people in California were found to have mercury poisoning. All of these people had used a home made face cream made in Mexico. The face creams came in jars without labels and were used to:

• make their skin a lighter color
• fade age spots and freckles
• get rid of acne

These face creams can harm your health and the health of your children. If you have an unlabeled jar of face cream, **stop using it immediately**. Also, do not use any face cream if the label says: “mercury”, “mercurio”, “calomel”, or another chemical with mercury, such as “mercurous chloride.”

How can mercury in face cream affect my health?

Mercury is a poison. Mercury in face cream can get into your body through your skin. The mercury can harm your brain, nerves, and kidneys. Mercury in your body may cause:

• Headaches, memory loss, difficulty concentrating, irritability (bad moods), nervousness, or depression
• Tremors (shaking) or weakness
• Tingling or numbness in hands and feet, and around the lips
• Fatigue (being very tired)
• Swollen or bleeding gums

http://www.dtsc.ca.gov/ContactDTSC/upload/CDPHMercuryCreamEng.pdf
Radio public service announcement

- Music: Up beat Latin Music
- Aunt (50): Oh Lucy, every day I notice more blotches on my face and I don’t know what to use to get rid of them.
- Lucy (35): You should try these home made creams from Mexico that Mrs. Lucha recommended to me, they’re good at whitening your face and getting rid of acne.
- RADIO: Attention, attention, the California Department of Public Health wants you to know that various families have been poisoned after using whitening creams without a label made in Mexico that contain Mercury, and urges anyone who has bought them to stop using them because they are endangering not only themselves but also other members of the family, especially children.
- Aunt: Turn up the radio Lucy, it sounds like they’re talking about these creams.
- RADIO: Mercury in these creams gets into your body through your skin and can cause headaches, memory loss, irritability, problems with concentration, (FADE OUT)
- Lucy: How awful! Could that be the reason why I’m in such a bad mood and I feel so tired?
- Narrator: If you have a face cream in an unlabeled jar, stop using it immediately, don’t throw it in the trash and call the California Poison Control Line at 1-800-222-1222, 1-800-222-1222.
Mercury Exposure Among Household Users and Nonusers of Skin-Lightening Creams Produced in Mexico — California and Virginia, 2010

Reported by


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Conclusions
Value of a public health investigation?

- Assist locals
- Development and dissemination of prevention recommendations
- Develop a body of knowledge on the effects of toxic substances and recurring issues during response
- Technical advice for clinicians regarding acute and chronic health effects and medical management
Challenges with public health investigations

- Resource intensive
- Difficult to identify and access exposed individuals
- Variety of stakeholders
- Right of access, but no “stick”
- Challenging to explain public health (vs. regulatory) role
Tools for public health investigation

- Assessment of Chemical Exposures (ACE) – Agency for Toxic Substances Disease Registry (ATSDR)
- Community Assessment for Public Health Emergency Response (CASPER), National Center for Environmental Health (NCEH)
  http://emergency.cdc.gov/disasters/surveillance/
- Emergency Responder Health Monitoring and Surveillance (ERHMS), National Institute of Occupational Safety and Health (NIOSH)
  http://www.cdc.gov/niosh/docket/review/docket223/
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