Pesticide Poisoning of Hospital Employees Associated With Attempted Suicide

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Florida Department of Health

Division of Environmental Health

Bureau of Environmental Public Health Medicine

Chemical Disease Surveillance Program

Pesticide Poisoning Surveillance
Laws & Statutes

- Florida Statute for reporting Diseases, Section 381.0031 (1,2)

“Any practitioner, licensed in Florida to practice medicine, ...., who diagnoses or suspects the existence of a disease of public health significance shall immediately report the fact to the department of Health”
Florida Statute, subsection 64D 3.002(1), F.A.C.

“each laboratory director or designee in charge of laboratory shall report, or cause to be reported evidence or suggestive of or diagnostic of diseases or conditions …..from any specimen derived from human body, or from animal …..within 72 hours of recognition by telephone or other electronic means, or in writing ….”
Figure 5. Pesticide-Related Illness and Injury Cases by Exposure Category, Florida 1998-2009

- **Average cases - 1998 to 2005 = 146.9**
- **2006 to 2009 = 442.3**
- **Direct access to poison control data in 2006 resulted in increase in pesticide exposure reports**
Organophosphate (OP)

- Agricultural pesticide
- Significant morbidity and mortality
- **SLUDGE** - Salivation, Lacrimation, Urination, Defecation, Gastrointestinal Distress and Emesis
- E.g Malathion
Malathion Use In FL - 2007-09*

- Total use - 900 lbs
- Rank 70 among all other pesticides in FL (total=169)
- Rank 28 among insecticide group of pesticides (total=66)
- Crops – Cabbage, Cucumber-fresh, Grapefruit; Orange, Squash, Strawberry, Tangelo, Tangerine, Tomato

*Ref: Summary of agricultural pesticide use in Florida: 2007-2009 (FL DACS)
Background

- 55 year-old male attempted suicide by ingestion of 14 oz of malathion (OP) and alcohol
- Symptoms – ↑HR, respiratory depression, vomiting, diarrhea & diaphoresis
- Patient treated in ED – Atropine & intubated
Emergency Medical Services

- EMS transported patient to the local hospital with bottle of Malathion (OP)
- Protocols not followed by EMS were:
  - No decontamination was conducted prior to transport
  - EMS did not wear appropriate PPE for a chemical ingestion call
  - EMS did not notify the emergency department (ED) staff of the type of substance ingested
Secondary Contamination

- Strong chemical odor from patient – hospital employees experienced symptoms of pesticide poisoning after patient management
- Contacted Hazmat teams, Poison Control Centers and County Health Department
- Evacuated ED (code black)
- Patient transferred to negative pressure unit
Epidemiological Investigation

- 1\textsuperscript{st} notification – local hospital, syndromic surveillance (ESSENCE)
- 17 hospital employees exposed, six reported symptoms
- Orange CHD conducted Epi investigation
- Medical records requested, cholinesterase testing recommended for exposed individuals
- An interview attempted with all symptomatic cases
**Pesticide Incident Monitoring/Reporting Form**

**Florida Department of Health**

Fax to: DOH/Bureau of Community Environmental Health
Attn: Pesticide Exposure Surveillance Program
Telephone number: (850) 245-4277
Pesticide Poisoning Hotline: 1-800-606-5810

### Reporting Person/Agency Information

- **Report date:**
- **Report time:**
- **Report source:**
- **Person/Organization reporting:**
- **Street Address:**
- **Telephone #:**
- **Person/Organization who received report:**
- **Title:**

### Exposed Person Demographic Information

- **Name:**
  - **First:**
  - **M.I.:**
  - **Last:**
- **Date of Birth:** / / 
- **City:**
- **County:**
- **Telephone #:**
- **Home:**
  - **Work:**
  - **Other:**
- **Sex:**
  - **Male**
  - **Female**
- **Race/Ethnicity:**
  - **White**
  - **Hispanic**
  - **Asian**
  - **Native American**
  - **Other:**
- **Address:**
- **City:**
- **County:**
- **Telephone #:**
- **Home:**
- **Work:**
- **Other:**
- **Sex:**
  - **Male**
  - **Female**
- **Race/Ethnicity:**
  - **White**
  - **Hispanic**
  - **Asian**
  - **Native American**
  - **Other:**
- **Address:**
- **City:**
- **County:**
- **Telephone #:**
- **Home:**
- **Work:**
- **Other:**

### Exposure/incident information

- **Date & time of incident:**
- **Type/Name of pesticide:**
- **Brief description of incident:**
- **Type of exposure:**
- **Site of exposure:**
- **Activity at time of exposure:**
- **Was injury work related?**
  - **Yes**
  - **No**
  - **Possible**
  - **Unknown**
- **If yes, company name:**
- **Occupation/Type of work:**
- **Street address:**
- **City:**
- **County:**
- **Telephone #:**
- **Home:**
- **Work:**
- **Other:**
- **Were other persons exposed?**
  - **Yes**
  - **No**
  - **Unknown**

### Health and Medical Information

- **Date of illness:**
- **Date of last follow up:**
- **Signs/symptoms:**
  - **Achilles Pain**
  - **Eye irritation**
  - **Dizziness**
  - **Diarrhea**
  - **Constitution**
  - **Nausea**
  - **Vomiting**
  - **Alteration of taste**
  - **Altered sensation**
  - **Abdominal pain**
  - **Eye irritation**
  - **Dizziness**
  - **Flash**
  - **Restlessness**
  - **Signs and symptoms are consistent with the pesticide poisoning**
  - **Confirmed laboratory/environmental evidence**
  - **Clinical diagnosis consistent with environmental/laboratory findings**
  - **Existence of temporal relationship between exposure and illness**

### Test/Laboratory Information

- **Name & Location of reporting laboratory:**
- **Type of test:**
  - **Cholinesterase**
  - **Pesticide Metabolite**
  - **Other**
- **Test results:**
  - **Positive**
  - **Negative**
  - **Unknown**
- **Date of test:**
- **Substance(s) detected:**

### Exposure and Health Effect Workup

*To be filled out ONLY by DOH Investigator*

- **Is the illness/injury related to pesticide exposure?**
  - **Yes**
  - **No**
  - **Unknown**
- **If yes, why?**
  - **Signs and symptoms are consistent with the pesticide poisoning**
  - **Confirmed laboratory/environmental evidence**
  - **Clinical diagnosis consistent with environmental/laboratory findings**
  - **Existence of temporal relationship between exposure and illness**

**Case classification (Evidence of health effect and linkage to pesticide toxicity):**

- **Definite**
- **Probable**
- **Possible**
- **Suspicious**
- **Unlikely**
- **Insufficient**
- **Not a Case**
- **Unknown**

**Length of hospitalization:**

**Length of time taken from work activities:**

**Severity of illness/injury duration and health outcome:**

- **Fatal**
- **High**
- **Medium**
- **Low**

**Investigators name:**
- **Telephone #:**
6 symptomatic, 5 met the case definition for pesticide poisoning

Average age – 34.8 years (25 to 44 years)

Females – 4 (80%)

Only 4 employees interviewed; however, data on the patient who was not interviewed has been included where available
# Investigation Findings

<table>
<thead>
<tr>
<th></th>
<th>Employee 1</th>
<th>Employee 2</th>
<th>Employee 3</th>
<th>Employee 4</th>
<th>Employee 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>38 years</td>
<td>30 years</td>
<td>37 years</td>
<td>25 years</td>
<td>44 years</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td>Nurse</td>
<td>House-keeper</td>
<td>Respiratory Therapist</td>
<td>Respiratory Therapist</td>
<td>Respiratory Technician</td>
</tr>
<tr>
<td><strong>Duration of Illness</strong></td>
<td>7 days (Hospitalization)</td>
<td>2 days (ED visit)</td>
<td>1 day</td>
<td>1 day</td>
<td>--</td>
</tr>
</tbody>
</table>
Employee 1 - Nurse

- Nurse was the first person to treat the patient
- Exposed to patient’s vomit and sweat (yellow-green in color)
- Reported ongoing vision problems and agitation
Employee 2 - Housekeeper

- Housekeeper performed terminal cleaning of the ED room where patient had been treated
- At the time of cleaning, patient was transferred to unit room, all bedding and equipments had been removed, and the room had been decontaminated
- 2 hours after cleaning housekeeper experienced symptoms
### Symptoms

<table>
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<th>Employee 3</th>
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<th>Employee 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nausea, Eye Irritation, Dyspnea, Blurred Vision, Headache, Confusion, Restlessness, Agitation, Weakness, Asphyxia, Syncope, Slurred Speech</strong></td>
<td><strong>Nausea, Vomiting, Dizziness, Headache, Dry Throat</strong></td>
<td><strong>Nausea, Eye Irritation, Dizziness, Pruritis, Dry Mouth, Sore Throat</strong></td>
<td><strong>Nausea, Eye Irritation, Pruritis, Headache, Dry Mouth</strong></td>
<td><strong>Eye Irritation, Lightheadedness, Facial Irritation</strong></td>
</tr>
</tbody>
</table>
## Interview Findings

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<th>Employee 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of exposure</strong></td>
<td>Patient Contact</td>
<td>Environmental Contact</td>
<td>Patient Contact</td>
<td>Patient Contact</td>
<td>Patient Contact</td>
</tr>
<tr>
<td><strong>Incubation period</strong></td>
<td>15-30 min.</td>
<td>2 hours</td>
<td>Immediate onset</td>
<td>½-2 hours</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Was PPE used?</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No, per medical record</td>
</tr>
<tr>
<td><strong>If Yes, What PPE was used?</strong></td>
<td>Gloves</td>
<td>Gown, mask, hair cover, shoe cover, double gloves</td>
<td>Mask, gloves</td>
<td>Gloves, later provided a half mask respirator</td>
<td>---</td>
</tr>
<tr>
<td><strong>Was the employee aware of the situation?</strong></td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Had the employee received prior hazmat training?</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
Nosocomial Poisoning Associated With Emergency Department Treatment of Organophosphate Toxicity — Georgia, 2000

Organophosphate Intoxication as a Consequence of Mouth-to-Mouth Breathing From an Affected Case*

Nurhan Koksal, MD, FCCP; Mehmet Akif Buyukbese, MD; Aytekin Gurven, MD; Ali Cetinkaya, MD; and Hatice Canan Hasanoglu, MD, FCCP

Secondary contamination in organophosphate poisoning: analysis of an incident

R. STACEY, D. MORFEY1 and S. PAYNE1

From Southampton General Hospital, Tremona Road, Southampton, UK, and 1Ealing Hospital, Uxbridge Road, Southall, Middlesex, UK

Received 24 July 2003 and in revised form 21 November 2003
Discussion

- Lack of appropriate respirators and PPE (skin and eyes) use by hospital staff
- One staff reported serious health effects – treated with atropine
- Early patient decontamination and use of appropriate PPE by all persons is necessary
- Highlights the importance of proper hospital room signage and communication of potential hazards to hospital personnel including housekeeping
Recommendations

- Decontaminate patient ASAP
- Patient treatment and decontamination should be conducted in well-ventilated area with regular rotation of employees
- Notify hospital before receiving chemically-contaminated patients
- Inform staff immediately about chemical poisoning and the possibility of secondary contamination
- Employees thoroughly wash after direct contact with patient’s bodily secretions and vomitus
Recommendations Cont.

- First responders and medical staff should wear appropriate PPE and breathing masks.
- Health care workers should use level C OR level B protection.
- ED should adhere to their emergency guidelines and decontamination protocols, train employees in the use of PPE and maintain adequate quantities of antidotes.
- Report all exposures to local health department and call Poison Control Center for patient management.
Thank You!!!