CD Summary

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OREGON PUBLIC HEALTH DIVISION • DEPARTMENT OF HUMAN SERVICES

ACUTE PESTICIDE POISONING IN OREGON: AN INCOMPLETE VIEW?

Acute pesticide poisoning is an important public health problem in Oregon, not only for those who work with restricted pesticides in occupational settings, but for citizens who use pesticide products in their households. Since 1987, acute pesticide poisoning has been a condition reportable by law to public health authorities.* This *CD Summary* reviews the signs and symptoms of selected pesticide exposures, presents data on pesticide poisoning in Oregon, and provides resources for health care providers.

PESTICIDE SYMPTOMS

Acute pesticide poisoning has long been an under-diagnosed illness.[1] The signs and symptoms of exposure to different pesticides in common use in the US today are listed in Table 1. Since many of the symptoms are non-specific and may involve multiple organ systems, and the patient may not offer a clear history of exposure, the diagnosis of acute pesticide poisoning is not always straight forward.

The CDC's National Institute for Occupational Safety and Health (NIOSH) has developed case definitions and classification criteria for acute pesticide poisonings (*www.cdc.gov/niosh/topics/pesticides/case.html*). Using these criteria, the Oregon Pesticide Exposure Safety & Tracking Program (PEST) defines as "likely" those cases that meet NIOSH criteria for "definite," "probable," or "possible" cases. A "likely" exposure means that, using data gathered from medical records, Oregon agency reports, and patient interviews, we could determine a causal pathway between a person's symptoms, the reported exposure, and the known toxicity of the pesticide.

OREGON DATA

From 2002 through 2007, 1,038 cases of acute pesticide poisoning were reported to the Oregon Pesticide Exposure Safety & Tracking Program of which 689 (66%) met criteria for a "likely" exposure. Table 2 shows the frequency of signs and symptoms reported by these cases. "Likely" cases were almost evenly split between males (49%) and females (51%).

An unexpectedly low number (18%) of acute pesticide poisoning cases were due to occupational exposures. Of these, 22% were reported as directly applying pesticides while 66% were exposed on the job from applications made by others. This is similar to the findings of a multi-state CDC/NIOSH study that found that 51% reported occupational exposures were in non-applicators exposed by pesticide drift or contaminated indoor air.[2]

More than 80% of pesticide exposures occurred in non-occupational settings. The majority of these (85%) occurred in residences (other settings included: outdoors on farms, roads, trails, or indoors in cars or offices).

The characteristics of patients exposed in occupational settings differed from those exposed in residential settings. More of the occupational exposures occurred in men (55%), whereas more residential exposures occurred in women (55%). For cases with a reported age, almost all (96%) the occupational exposures were in persons aged 18–64 years (since that is, after all, working-age). In contrast, 31% of non-occupational exposures were in minors, 60% in persons 18–64 years, 9% in those ≥65 years.

The figure (*verso*) shows the number of acute pesticide poisoning cases reported in Oregon over the past decade, which has gradually inched up over time. The majority (65%) have been reported by the Oregon Poison Center, and the Pesticide Analytical Response Center (18%) (PARC; see

Table 2. Symptoms reported by "likely" pesticide poisoning cases in Oregon, 2002—2007 (n = 689)†

Sign & Symptoms	Frequency*	Percent*
Respiratory	249	36
Ocular	248	36
Neurological	226	33
Gastrointestinal	220	32
Dermal	177	26
Cardiac	28	4
Renal	2	0.3
Other (fever, fatigue)	74	11

†Total exceeds 100% since cases could report multiple symptoms.

Table I. Symptoms Accsociated with Selected Pesticide(s)

Chemical Class	Acute Symptoms	Confirmation of Poisoning?
Pyrethroid, pyrethrin insecticides (permethrin, cyfluthrin)[4]	Irritation and swelling of mucous membranes, asthma, pruritis, contact dermatitis; paresthesias	Recent environmental & occupational patient history
Anticoagulant rodenticides (brodifacoum, bromadilone, chlorophacinone, difenacoum, diphacinone[5]	<6 years of age, often no symptoms; coagulopathy with significant/intentional ingestion; unexplained bleeding	Patient history; unexplained bleeding indicates need for measurement of prothombin time or international normalized ratio (INR)
Organophosphate (OP) Insecticides (chlorpyrifos, diazinon, malathion)[1]	Miosis, headache, hypersecretion, twitching, nausea, respiratory depression, loss of conciousness	Patient history; if probable, treat immediately; test plasma pseudocholinesterase & RBC AChE levels
Insect Repellent (diethyltoluamide - DEET)[6]	Tingling, mild irritation; erythemtaous rash with >50% concentration	Patient history

* OAR 333-018-000 through 020

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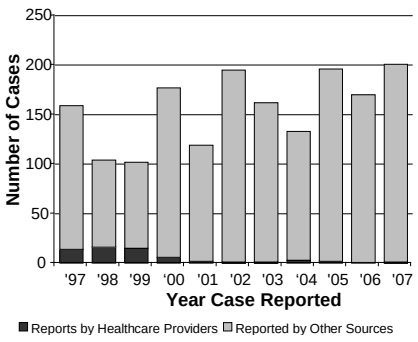
below). Unfortunately, reporting from health care providers has steadily declined over time.

Cases reported by source, Oregon



ASK EXPOSURE QUESTIONS

The non-specific nature of the symptoms makes asking questions about a patient's possible pesticide exposure history critical.[1] Given the brevity of office visits, three basic questions about a patient's recent activities can assist in identifying possible acute pesticide poisoning.[3]

1. Are there any physical activities that you've done recently at home, work or in your community that you feel are harmful to you?
2. Do you think you've recently been exposed to chemicals or odors at home, at work or in your community?
3. Do you think these are harming you?

PUBLIC HEALTH FOLLOW-UP

To report a case of suspected acute pesticide poisoning:

- Call the Public Health Division PEST program at 971-673-0400, or your Local Health Department. (See *www.oregon.gov/DHS/ph/lhd/lhd.shtml* for phone numbers.)

  OR

- Fax (971-673-0979) medical records, with the patient's contact information, to the Public Health Division, or mail them to:

  Pesticide Exposure Safety & Tracking Program
  Oregon Public Health Division
  800 NE Oregon St., Ste. 640
  Portland, OR 97232

Investigations of acute pesticide poisoning cases can help us to identify areas for public health intervention and education. Frequently, what may be reported as a single complaint may lead to identification of pesticide exposures in others. Immediately upon receiving a report, we call the patient to ask additional questions about their exposure to pesticides, including: Were others exposed? Do you know the exact name of the pesticide? Did this happen at work?

The Oregon Pesticide Exposure Safety & Tracking Program may also refer the case to the Pesticide Analytical Response Center (PARC) Board with permission of the affected individual. PARC includes representatives from the Oregon Departments of Agriculture, Forestry, Fish & Wildlife, Environmental Quality, Human Services, Occupational Safety & Health Administration; the State Fire Marshall ;and the Oregon Poison Center. PARC coordinates the investigations of pesticide-related incidents involving reported impacts to human health, animal health, and/or the environment. Activities include: collecting incident information; mobilizing expertise for investigations; identifying trends and patterns of problems; making policy or other recommendations for action; and reporting results of investigations. See *www.oregon.gov/ODA/PEST/parc.shtml* for more information.

RESOURCES

- Oregon's Pesticide Exposure Safety & Tracking (PEST) Program, *www.oregon.gov/DHS/ph/pesticide/index.shtml*.
- Oregon Poison Center (1-800-222-1222) provides medical advice on suspected cases.
- The National Pesticide Information Center (1-800-858-7398 or *http://npic.orst.edu/index.html*) is a cooperative agreement between Oregon State University and the Environmental Protection Agency, to provide non-urgent, science-based information on pesticides.

REFERENCES

1. Office of Pesticide Programs, US EPA. Recognition and management of pesticide poisonings. Reigart JR, Roberts, JR, eds. 5th edition. 1999. Available at *www.epa.gov/pesticides/safety/healthcare/handbook/handbook.htm*.
2. Calvert GM, et al; Acute occupational pesticide-related illness in the US, 1998–1999: Surveillance findings from the SENSOR-pesticides program. Am J Ind Med 2004; 45: 14–23.
3. Liebman AK and M Rowland. To ask or not to ask: The critical role of the primary care provider in screening for occupational injuries and exposures. J Public Health Manag Pract 2009; 15: 173–5.
4. Bradberry SM, et al. Poisoning due to pyrethroids. Toxicol Rev 2005; 24: 93–106.
5. Watt BE, et al. Anticoagulant rodenticides. Toxicol Rev 2005; 24: 259–69.
6. National Pesticide Information Center. Using DEET safely: Medical case profile. Available at *http://npic.orst.edu/mcapro/DEET.pdf*.