



Pathology Biology Section – 2007

G37 Suicide by Ingestion of Carbamate Insecticide: Case Report and Regional Variations

Lucas D. Duke, BS*, Drexel School of Medicine, 2125 Spring Garden Street, #3R, Philadelphia, PA 19130; Sepideh Samzadeh, BS, Drexel University School of Medicine, 135 South 20th Street, Apartment #1506, Philadelphia, PA 19103; and Fredric N. Hellman, MD, MBA, Office of the Medical Examiner, Delaware County, Route 352-Fair Acres, Lima, PA 19037

After attending this presentation, attendees will understand how insecticide ingestion is a significant method for suicide both globally and nationally. Attendees will also understand the possible threats to first responders and healthcare personnel attending to victims of insecticide self-ingestion.

This presentation will impact the forensic community and/or humanity by attempting to further increase understanding of suicide patterns, focusing upon a means not commonly observed in the United States but frequently employed in select regions of Asia. In addition to addressing mechanisms of actions and common routes of administration, health risks that such ingestions present to responding personnel are also presented. Based upon commonly understood risk factors leading to insecticide-related suicide from certain areas of Asia, potential parallels to certain regions of the United States are reviewed. Additional issues explored include assessing the predisposition to insecticide-related suicide based on geography, agricultural intensity, accessibility to such poisoning agent(s), and relative lack of access to medical centers capable of rendering rapid treatment and antidote(s).

Propoxur (Baygon) is a potent carbamate insecticide used to control cockroaches, flies, mosquitoes, and lawn and turf insects. It is also a poison used to complete suicide. Insecticide intoxication is a significant method of suicide in some areas of the world. A 55-year-old black male was found unresponsive in his garage with a glass of Propoxur adjacent to him. Upon transport to a suburban Philadelphia hospital emergency department, fumes from the insecticide emanated from the victim's body, sickening 29 hospital workers and 12 hospital patients. As a safety precaution, the hospital was quarantined and its employees decontaminated. It is imperative for physicians, emergency medical service personnel, and investigators to be aware of the risks and detrimental consequences involving deaths associated with insecticide ingestion. While proper handling of patients is crucial, healthcare personnel should be aware of the public health risks created by individuals who ingest select poisons. Propoxur's mechanism of action relies upon the reversible carbamylation of acetylcholinesterase, resulting in a subsequent accumulation of acetylcholine in myoneuronal junctions (i.e., both in nicotinic and muscarinic systems). The modes of absorption include inhalation, ingestion, and dermal penetration, and the pertinent signs and symptoms include diaphoresis, urination, bradycardia, seizures, and bronchospasm. Insecticide ingestion as a means of suicide is stratified by two principal variables, these being availability of the agent(s) utilized and the related variable of agricultural intensity within the region of the world studied. In rural, agricultural regions of Sri Lanka and China, a high incidence of self-poisoning deaths have been attributed to harsh living conditions, stressful situations, accessibility to the poisoning agent(s), and relative lack of access to medical centers capable of rendering rapid treatment and an antidote(s). Access to lethal means is one principal variable observed from suicide patterns in the United States, though the most common injury associated with completed suicides in this country derives from firearms. The premise proposed is that those regions of the United States which parallel most closely those conditions predisposing to suicidality as observed in Sri Lanka and rural China should exhibit higher insecticide ingestion-related suicide rates in comparison to other areas of the country.

Insecticide, Suicide, Healthcare Worker Risks