Arsenic Poisoning Report - 2010

Description

The human health effects from arsenic poisoning have been the focus of much recent attention. In 2006, the U.S. Environmental Protection Agency (EPA) set the arsenic standard for drinking water at 10 parts per billion. This level is designed to protect consumers served by public water systems from the adverse health effects of chronic exposure to arsenic. Common sources of potential arsenic exposure in Florida are chromated copper arsenate (CCA) treated wood, tobacco smoke, certain agricultural pesticides, and some homeopathic and naturopathic preparations and folk remedies. In addition, arsenic is a naturally occurring contaminant found in water in certain areas of Florida affecting (unregulated) private drinking wells in particular.

Arsenic intoxication may affect multiple organ systems. Acute exposure to toxic amounts of arsenic may include signs and symptoms such as vomiting, abdominal pain, diarrhea, light-headedness, headache, weakness, and lethargy. These signs and symptoms may rapidly lead to dehydration, low blood pressure, fluid build up in the lungs, congestive heart failure and shock. Other clinical manifestations may follow, including abnormal heartbeats (slow or fast), altered mental status, and multi-system organ failure which may ultimately lead to death. Prolonged arsenic exposure has been associated with a greatly elevated risk of skin, lung, liver (angiosarcoma), bladder, kidney and colon cancers. Skin lesions, neuropathy, and anemia are also key findings of chronic arsenic exposure.

Exposure to arsenic and detection of arsenic poisoning can be measured through testing hair, fingernail clippings, blood or urine of the patient. Testing of urine is considered the most reliable method for acute exposures. For surveillance and reporting, only 24 hour urine and urine creatinine tests are considered valid tests. Elevated inorganic or total urinary arsenic levels, >50 μg/L total for a 24-hr urine, as determined by a laboratory test meets the laboratory criteria for diagnosis.

Most cases of arsenic-induced toxicity in humans are due to exposure to inorganic arsenic. Organic arsenic found in fish is not believed to be toxic. Total arsenic tests do not distinguish between organic and inorganic arsenic (the more toxic form). For this reason, positive total arsenic laboratory test results from specimens taken within 72 hours of consumption of seafood do not meet the laboratory criteria for diagnosis.

Disease Abstract

Arsenic poisoning became a reportable condition in Florida on November 24, 2008. Reported cases are classified based on clinical presentation and laboratory results. A confirmed case is a clinically compatible case that meets the laboratory criteria for diagnosis. A probable case is a clinically compatible case in which a high index of

suspicion for arsenic exposure also exists: patient's exposure history regarding location and time indicates arsenic exposure or an epidemiologic link exists between this case and a laboratory-confirmed case.

Laboratory criteria for diagnosis
Elevated inorganic or total urinary arsenic levels (>50 µg/L total for a 24-hr urine) as determined by laboratory test.

If laboratory results for urine are reported in µg As/g creatinine (mcg/g creat) and are >15 µg/g creatinine, then results must be converted to µg As/Liter of urine using the following formula and conversion factor.

_____	(µg As/g creat) x	_____	(mg creat/dL) x 0.01 =	_____	(µg As/Liter urine)
given		given		calculated	

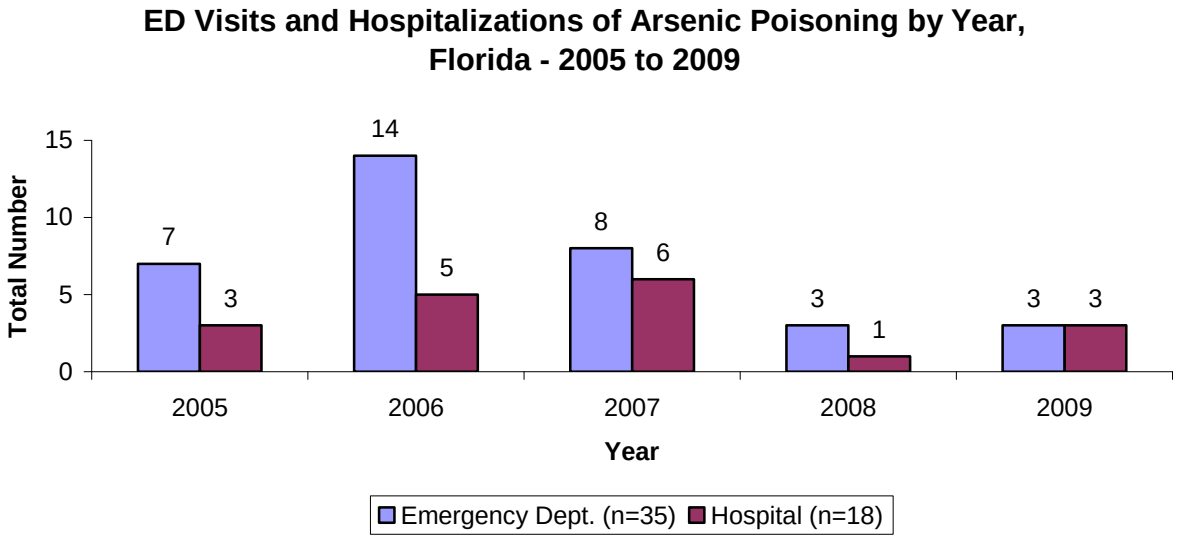
There were twelve cases of arsenic poisoning reported during 2010. All of the cases were investigated by the patients' county health department and reported in Merlin. Counties who reported cases are Bay (1), Broward (2), Brevard (1), Charlotte (1), Marion (1), Martin (1), Pasco (1), Pinellas (2), Polk (1), and St. Lucie (1). Cases were predominantly male (8, 66.7%). Cases ranged from 33 to 79 years of age, the mean and median age of cases was 59.3 and 58.5 respectively.

Among the twelve reported cases of arsenic poisoning, eight were among Whites, three Non-Whites and one with unknown race. Only six cases reported ethnicity and two were reported as Hispanic. Nine cases had unintentional exposure, one intentional and two were with unknown intent. Source of arsenic exposure was unknown for two cases (16.67%). The sources reported for the remaining cases were exposure to agricultural pesticides (3), vitamin supplements (2), CCA-treated wood (1), drinking well water (1), cigarette smoking (1), spraying paint (1) and work in mining industry (1). Among 12 cases only two (16.67%) reported being hospitalized.

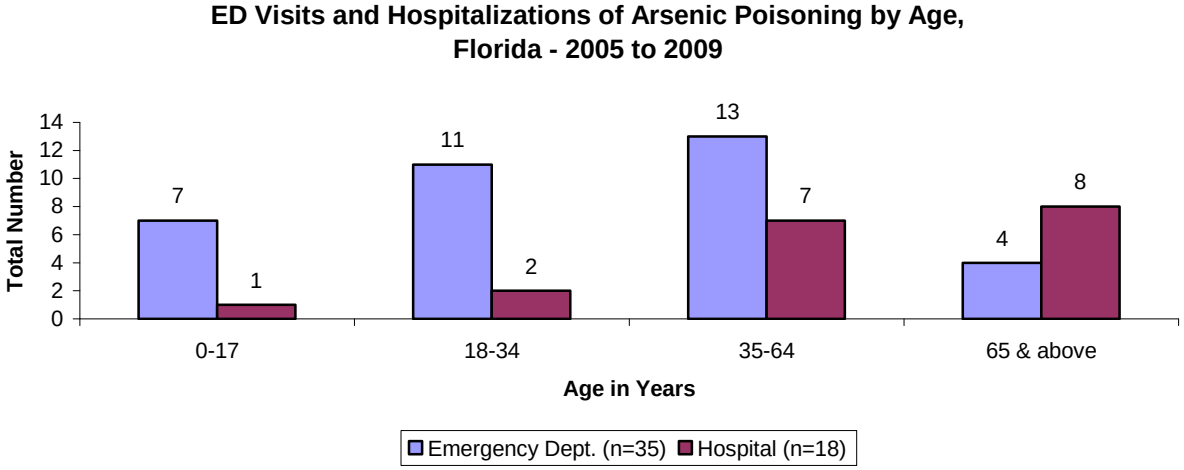
Analysis of ED visits and Hospitalizations: 2005 – 2009

In order to better estimate the burden of arsenic related poisonings, hospitalizations, emergency department (ED) visits and mortality data were searched for arsenic related poisonings using relevant International Classification of Disease (ICD) codes. Selected codes were 985.1, E950.8, E980.8, E866.3 and T57.0*.The data was extracted for one or more ICD codes present in the primary or secondary diagnosis from years 2005 through 2009.

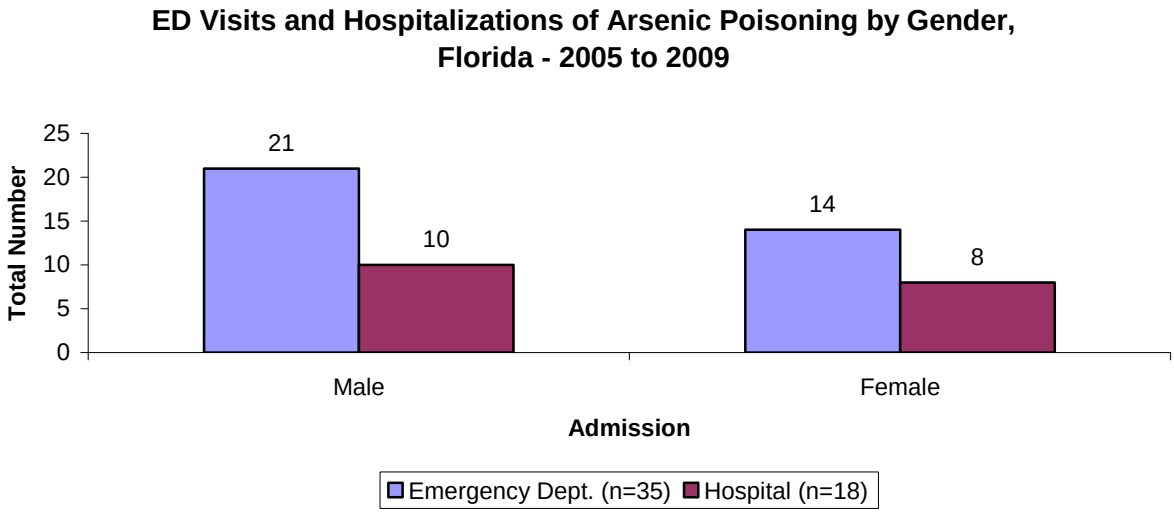
There were a total of 53 ED visits (n=35) and hospitalizations (n=18) related to arsenic poisoning reported from 2005 through 2009 in Florida. No arsenic related deaths were recorded during this time. Reports identified in ED visit and hospitalization data were not matched with cases identified in Merlin data and are not unduplicated.



The majority of the ED visits were among adults 18 to 34 (31.4%, n=11) and 35 to 64 (37.1%, n=13) years of age. The majority of hospitalizations were also among adults, but more so among older adults: 80% of all cases were among age groups 35 to 64 (38.9%, n=7) and 65 years and above (44.4%, n=8).



Patients were primarily White (ED visits=31, 88.6% & hospitalization=16, 88.9%), with only 2 ED visits and 2 hospitalization among Black/ African American. Hispanic ethnicity was reported by six individuals (ED visits=3, 8.6% and hospitalizations=3, 16.7%) Males represents 60 % (n=21) of all ED visits and 55.6% (n=10) hospitalizations in this report.



Prevention

The Florida Department of Health performs surveillance for arsenic poisoning and prevents poisonings through education. According to Florida statute public water supplies must be tested for arsenic. Florida drinking water standards for arsenic set the minimum concentration level (MCL) at 10 micrograms per liter (µg/L). This level is set to protect Floridians against the risk of arsenic poisoning. Drinking water from private wells, particularly in areas with known high arsenic in ground or well water, should be tested by the homeowner specifically for arsenic.

Prevention tips for arsenic exposure: (CDC)

- If your drinking water source is a private well, and you suspect higher arsenic concentrations, have your well water tested. Use bottled water for drinking until the well is shown to be safe or until appropriate water filtration systems are put in place to remove the arsenic.
- Stop smoking. Cigarettes contain arsenic.
- Ensure a well balanced diet rich in selenium, other antioxidants, and folate.
- When using CCA-treated lumber in nonresidential applications, follow the warnings regarding the wearing of personal protective equipment such as gloves, eye, and respiratory protection.
- Have children wash their hands after playing on CCA-treated lumber play equipment.
- Consider annual application of a sealant on any existing CCA-treated lumber surfaces.
- Limit sun exposure and use sunscreen to help decrease the risk of skin cancer. Exposure to arsenic and UVB radiation together may further increase the risk of developing skin cancer.

- Discuss your concerns regarding arsenic and prevention of hazardous exposures at the workplace with your employer and/or workplace health and safety representative
- If you think arsenic is making you sick, contact your physician to seek medical assistance and contact your County Health Department to report arsenic poisoning.

Additional Resources:

Disease information is available from the Center for Disease Control and Prevention (CDC) at http://www.bt.cdc.gov/agent/arsenic/

The Chemical Disease Surveillance Program collects arsenic poisoning data as a part of our disease reporting system. For more information about the program please visit http://www.myfloridaeh.com/medicine/arsenic.html

*** ICD-9 CM and ICD-10 CM codes for arsenic.**

ICD-9 CM

985.1 - Arsenic and its compounds
E950.8 - Arsenic and its compounds
E980.8 - Arsenic and its compounds
E866.3 - Arsenic and its compounds and fumes

ICD-10 CM

T57.0 - Arsenic and its compounds

ICD-9-CM = International Classification of Diseases, Ninth Revision, Clinical Modification
ICD-10 = International Classification of Diseases, 10th Revision