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Your Health Connection

PUBLIC HEALTH ALERT

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Heavy Metal Toxicity Associated with Ayurvedic Medicinal Products

Attention: Physicians, Emergency Departments, Infection Control Practitioners, Occupational Health Practitioners, Walk-In Clinics/Urgent Care Clinics, Nurse Practitioners, EMS, Designated Officers, Midwives, Family Health Teams, Pharmacies, Central LHIN, NSM LHIN, Beausoleil First Nation, Moose Deer Point First Nation, Rama First Nation, Wahta First Nation

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A recent case of lead toxicity in Ontario has been linked to the use of unlicensed Ayurvedic medicinal products (pills and incense) located at Kerela Ayurvedic & Natural Herbal Consultation in Toronto, ON. Health Canada has issued an advisory related to this incident in consultation with Toronto Public Health.

Some health products were ordered to be delivered to clients' homes. Some pills tested contained high amounts of lead and/or mercury. Clinicians should be alert to the use of Ayurvedic medicines and symptoms in their patients and order a venous blood lead level (BLL) if lead toxicity is suspected.

Some Ayurvedic medicines, as in the current investigation and previously in Ontario, have been found to contain harmful levels of lead, mercury, and arsenic (6). Clinicians are advised to remain vigilant for the use of these products by their patients, given their associated health risks. Depending on the degree of toxicity, patients with elevated BLLs may appear asymptomatic or may exhibit a range of signs and symptoms. These include:

- Abdominal pain, ranging from occasional discomfort, to diffuse pain, to "lead colic" (severe, intermittent abdominal cramps)
- Constitutional symptoms, primarily fatigue and general malaise
- Anemia
- Neurological dysfunction including poor concentration and peripheral motor neuropathy (6)

Chronic lead exposure can have long term sequelae, including chronic interstitial nephritis or "lead nephropathy", increased risk of hypertension, adverse reproductive effects, and neurological deficits related to learning, attention and development, especially in children (6).

Medical Investigations for Lead Toxicity

- CBC: hemoglobin, hematocrit may be low
- Peripheral smear: may be normochromic and normocytic, or hypochromic and microcytic; basophilic stippling may be present in patients exposed to lead at sufficiently high levels
- BUN, creatinine and uric acid might be elevated

- Blood lead level (BLL) and suggested follow-up actions:
    - Median BLL in Canadians aged 3-79: 0.044 µmol/L (0.92 µg/dL) (4)
    - BLL > 0.48 µmol/L (10 µg/dL) is uncommon and may warrant environmental evaluation and repeat BLL testing
    - BLL > 0.97 µmol/L (20 µg/dL) should prompt specialist referral for assessment of possible lead-related effects and need for therapy
- Lead toxicity should be considered in patients presenting with abdominal symptoms and anemia.

A blood lead level (BLL) can confirm whether findings are likely attributable to lead exposure.

Management of Lead Toxicity and Resources

- Removal of the source of exposure is the cornerstone of the management of a patient with lead toxicity. (5)
- Clinicians may consult the following for guidance on assessment and management
    - Ontario Poison Centre: 1-800-268-9017 (416-813-5900)
    - Occupational and Environmental Health Clinic at St Michael's Hospital: 416-864-5074

Clinicians may contact their local Public Health Unit for assistance on investigating potential sources of lead exposure where the BLL is >0.48 µmol/L (10 µg/dL).

Mercury

Signs, symptoms and health effects from mercury exposure will vary based on concentration of exposure, route of exposure, duration of exposure, as well as individual susceptibility (2). Chronic exposure to mercury primarily affects the central nervous system (2). In children, developmental milestones should be evaluated (2).

Laboratory Tests for Mercury

Urine levels of mercury provide the most appropriate assessment of mercury exposure and are useful for the assessment of acute and chronic exposures (2). A 24-hour urine specimen showing a urinary mercury concentration of less than 2 micrograms per liter (µg/L) would be considered within the background range (2). A blood analysis may be performed during the first 3 days after an acute high-level exposure (2). Interpretation of blood Hg levels may be complicated by dietary sources of mercury (2). A blood concentration of 50 µg/L or greater is considered the threshold for symptoms of toxicity (2).

Mercury Management and Treatment

Symptomatic patients who have experienced acute high-dose mercury inhalation exposure should receive supportive care and be monitored for symptoms (2). For severe symptoms and highly elevated circulating levels of mercury, chelation may be required (2).

Arsenic

Signs, symptoms and health effects from arsenic exposure will vary based on dose, route of exposure, chemical form, frequency, duration and intensity of exposure as well as time-elapsed since exposure (1). In acute arsenic poisoning, death is usually due to cardiovascular collapse and hypovolemic shock. Skin lesions and peripheral neuropathy are the most suggestive effects of chronic arsenic exposure (via inhalation or ingestion); neuropathy can occur insidiously in chronic toxicity without other apparent symptoms (1).

Laboratory Tests for Arsenic

Early clinical diagnosis of arsenic toxicity is often difficult; a key laboratory test in recent exposures is urinary arsenic excretion (1). Urinary levels of arsenic may drop rapidly in the first 24-48 hours after acute exposure; as a result, a urine specimen for arsenic analysis should be obtained promptly. Total arsenic values in excess of 100 micrograms (µg) per liter (L) (µg/L) are considered abnormal; however, total arsenic measurement in human urine assesses the combined exposure from all routes of exposure and all species of arsenic (1).

Arsenic Management and Treatment

Gut decontamination and hemodynamic stabilization are key factors in the initial management of acute arsenic intoxication (3). Patients with suspected acute arsenic poisoning generally require rapid stabilization with fluid and electrolyte replacement (3). Chelating agents administered within hours of arsenic absorption may successfully prevent the full effects of arsenic toxicity (3).

Additional Information

For more information on lead exposure from Ayurvedic medicinal products, please refer to the Public Health Ontario fact sheet, Fact Sheet: Lead Exposure from Ayurvedic Medicines (publichealthontario.ca)

Contact SMDHU for assistance investigating potential sources of lead exposure, where BLL exceeds 0.48 µmol/L (10 µg/dL).
Public information is available in multiple languages from Toronto Public Health, available at Health Impacts of Lead – City of Toronto

References

(1) Agency for Toxic Substances and Disease Registry. Clinical Assessment; 2010. Available from: Arsenic Toxicity: Clinical Assessment | Environmental Medicine | ATSDR (cdc.gov)

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(3) Agency for Toxic Substances and Disease Registry. How Should Patients Overexposed to Arsenic Be Treated and Managed?; 2010. Available from: Arsenic Toxicity: How Should Patients Overexposed to Arsenic Be Treated and Managed? | Environmental Medicine | ATSDR (cdc.gov)

(4) Health Canada. Fourth report on human biomonitoring of environmental chemicals in Canada. Ottawa, ON: Her Majesty the Queen in Right of Canada, represented by the Minister of Health; 2017. Available from: Fourth Report on Human Biomonitoring of Environmental Chemicals in Canada - Canada.ca

(5) Kosnett MJ, Wedeen RP, Rothenberg SJ, Hipkins KL, Materna BL, Schwartz BS, et al. Recommendations for medical management of adult lead exposure. Environmental Health Perspectives 2007; 115(3): 463-71. Available from: https://ehp.niehs.nih.gov/doi/full/10.1289/ehp.9784

(6) Public Health Ontario. Fact Sheet: Lead Exposure from Ayurvedic Medicines. Toronto, ON; 2019. Available from: Fact Sheet: Lead Exposure from Ayurvedic Medicines (publichealthontario.ca)