Lead Ingestion Associated with Ceramic Glaze -- Alaska, 1992

In August 1992, a physician notified the Alaska Division of Public Health (ADPH) that three patients at a psychiatric hospital had consumed ceramic glaze during ceramic therapy (i.e., recreation therapy involving the production of ceramic ware), and two of these patients had elevated blood lead levels (BLLs). This report summarizes the ADPH's investigation of these ingestions. Case Investigations

Patient 1. On August 18, an 11-year-old patient, admitted for conduct disorder, consumed approximately 2 fluid ounces of ceramic glaze. The patient was taken immediately to the emergency room of a nearby hospital and was treated by gastric lavage and activated charcoal administered by mouth. Because ceramic glaze can contain lead, a blood sample was obtained to be tested for lead and zinc protoporphyrin (ZPP) levels. The BLL obtained approximately 1 hour after ingestion of the glaze was 163 ug/dL; ZPP level was 25 ug/dL (normal: less than 35 ug/dL). However, the BLL was not known until August 21. Repeat tests for BLL on August 21 and 28 and September 9 were 61 ug/dL, 45 ug/dL, and 35 ug/dL, respectively. Chelation therapy was not given, and the patient remained asymptomatic.

Patient 2. On August 18, a 13-year-old patient, admitted for conduct disorder and depression, consumed a small amount of liquid ceramic glaze. A BLL obtained approximately 1 hour after ingestion of the glaze was less than 5 ug/dL; ZPP was 54 ug/dL. A repeat BLL on August 21 was less than 5ug/dL.

Patient 3. On August 15, a 58-year-old patient, admitted for psychosis with suicidal ideation, consumed approximately 4 fluid ounces of ceramic glaze. The next day, the patient complained of abdominal pain. A BLL obtained on September 1 was 61 ug/dL; ZPP was 105 ug/dL. No treatment was given, and the patient had no additional gastrointestinal symptoms. Follow-up Investigation

The glazes consumed by patients 1 and 3 were 25%-29% and 43% lead by weight, respectively. Soluble lead accounted for up to 32% of the total weight of both of these glazes. The glaze consumed by patient 2 was less than 0.06% lead by weight and was considered "lead-free."

At the time of these episodes, two large psychiatric facilities in Alaska offered ceramic-therapy programs that used lead-based glaze. Approximately 1400 patients participated in ceramic-therapy programs at these two facilities. In addition, of 15 nursing homes in Alaska contacted by the ADPH, four had used lead-based glaze in ceramic therapy. Following these ingestions, the ADPH requested that psychiatric facilities and nursing homes discontinue use of lead-based glaze in ceramic therapy.

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Editorial Note

During 1991, the American Association of Poison Control Centers received reports of 318 incidents of ceramic glaze ingestion in the United States (1), of which nine (2.8%) were intentional; 307 (96.5%), unintentional; and two (0.6%), of unknown intent. From 1984 through 1990, the Fresno County (California) Regional Poison Control Center received reports of 75 persons who ingested lead-based ceramic glaze (2); of these, 34 (45.3%) occurred in extended-care facilities and for 32 (42.7%) persons, impaired mental status was known before ingestion. Nursing home patients who developed lead poisoning after ingesting lead-based glaze while participating in ceramic therapy include four persons (one of whom died of lead encephalopathy) in Pennsylvania (R. Roberge, University of Pittsburgh Medical Center, personal communication, September 24, 1992) and one person in Maryland (P. McLaine, Division of Lead Poisoning Prevention, Maryland Department of the Environment, Baltimore, personal communication, September 30, 1992). In 1988, following a series of lead poisonings among patients who ingested ceramic glaze, Arizona banned the use of lead-based glaze in nursing homes (3).

Since 1990, all arts and crafts products sold in the United States are required to be labeled in conformance with Standard D-4236 of the American Society for Testing and Materials (ASTM).* Under this standard, toxic products, including lead-based glazes, must be marked with a signal word such as "warning" or "caution," a list of ingredients, instructions for safe use of the product, and a statement that the product is inappropriate for use by children. Additional labeling such as "safe for food containers" or "food-safe" indicates that lead from a correctly fired piece of pottery will not leach; unfired glaze, however, may contain lead that can be absorbed if ingested.

In 1987, the Art and Craft Materials Institute (ACMI), a nonprofit association that sponsors a certification program of arts and crafts products to document conformance with labeling laws, informed nursing homes and occupational therapists nationally of the hazards associated with using toxic materials in institutional settings. ACMI recommends that in situations where supervision is required (e.g., elementary schools, hospitals, nursing homes, and psychiatric institutions) only "lead-free" glaze be used (4). ACMI also supports additional product labeling that specifically cautions against the use of toxic materials in these facilities. Glazes distributed after 1990 that are labeled "conforms to ASTM D-4236" and have no health warnings are considered nontoxic.

References


   Amendment to the Federal Hazardous Substances Act (Public Law 100-695).