Determination of Lead in Biological Specimens From a Homicidal Poisoning Case with Kohl (Lead Sulfide)

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CASE HISTORY: Kohl is a grey or black powder used as an eye cosmetic in Middle East, India, Pakistan and some parts of Africa. In Upper Egypt Kohl is considered as one of the most common and cheap traditional eye cosmetics. To date, postmortem concentrations of lead from kohl poisoning were not recorded. We report a case of unusual homicidal poisoning by Kohl.

A 20-year-old female got pregnant illegally. Her mother prepared her an omelet sandwich mixed with kohl. The same day she was admitted to the hospital and after one hour she died. An autopsy was performed. Samples were sent for toxicological analysis. The aim of this research is to determine the lead in postmortem human biological specimens using Flame Atomic Absorption Spectrophotometry (FAAS).

METHODS: Stomach contents, blood, liver and kidney were received by Assiut Chemical Laboratory of the medico-legal department. Screening of sulfide was performed by adding a solution of 3 mL of dilute sulfuric acid to 10 gm of the stomach contents. Hydrogen sulfide fumes turned lead acetate paper black. Lead was determined by using 10 gm of the tissue or 10 mL of the blood. The tissue samples were segmented into small pieces and homogenized in a blender. The samples were digested with 20 mL of concentrated HCl (12 N) for 30 minutes in a water bath. The resulting digest was filtered and diluted with 50 mL deionized water. FAAS was used to determine the lead concentration.

RESULTS AND CONCLUSIONS: Analysis of postmortem specimens revealed the following lead concentrations: blood (33.41 mg/L), liver (13.48 mg/Kg) and kidney (12.72 mg/Kg).

Keywords: Lead sulfide, Biological specimens, Atomic absorption spectrophotometry