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38. Characteristics of Patients Presenting to a Medical Toxicologist for Exposure to Heavy Metals

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Background: Adult patients commonly present to medical toxicologists for evaluation of potential heavy metal exposure, but are poorly characterized in the toxicology literature.

Research question: This study aims to characterize patients who present to a medical toxicologist for evaluation of heavy metal exposure.

Methods: An advanced search of the ACMT Toxicology Investigators Consortium database was performed from the January 1, 2010 through October 10, 2013 for exposure to heavy metals (see Table for individual metals). Exclusion criteria were less than 18 years of age or age range not recorded. Additionally, acute iron exposures were excluded. The following data were collected: demographics, source of referral, reported signs or symptoms, and therapy provided. Results: Fifty-four adult patients were identified. Of these, 55.5 % of patients were male, with an average age of 52 (SD, 16.2). Reasons for referral were predominantly interpretation of prior lab data (31, 57.4 %), unintentional nonpharmaceutical exposures (17, 31.5 %), and organ dysfunction (7, 13 %). The most common exposures were cobalt (21, 38.9 %), chromium, and mercury (13, 24.1 % each). Fifteen patients reported exposures to more than one metal. Thirty-seven (68.5 %) patients had symptoms reported. The most frequent were numbness/paresthesias (eight, 21.6 %), rash (four, 10.8 %), nausea/vomiting (two, 5.4 %), peripheral neuropathy (two, 5.4 %), and hemolysis (two, 5.4 %). Only six patients (11.1 %) were judged to have symptoms most likely related to a toxicological exposure. Eight patients (14.8 %) received toxicological treatment, including four of the six patients with symptoms likely related to a toxicological exposure. Three patients received chelation with succimer, while one also received vitamin C, and another received dimercaprol, gastric lavage, whole bowel irrigation, and intravenous fluids. The fourth was treated with intravenous fluids.

Conclusion: This review of database information on adult patients presenting to a medical toxicologist for evaluation of heavy metal exposure finds that these patients are more often men referred by a primary care doctor or other outpatient physician. The most common exposures were cobalt, chromium, and mercury. Limitations include reliance on providers to enter information, resultant incomplete data entry, or potential reporting bias towards more unusual cases.

Table (Abstract 38). Characteristics of patients with heavy metal exposures

Demographics							
Age	Range, 20–89	Mean, 51.6; (SD 16.2)	Median, 51	Mode, 44	Only age range 19–65 or >65 reported 9 (16.7 %)		
Gender	Male, 30 (55.5 %)	Female, 24 (44.4 %)					
Referral							
Source	Primary care physician or other outpatient physician, 26 (48.1 %)	Self-referral, 13 (24.1 %)	Emergency department, 8 (14.8 %)	Admitting service, 4 (7.4 %)	Employer/independent medical evaluation/ workmen's compensation 1 (1.9 %)	Poison center, 1 (1.9 %)	
Reason*	Interpretation of laboratory data, 31 (57.4 %)	Unintentional nonpharmaceutical exposure, 17 (31.5 %)	Organ dysfunction, 7 (13 %)	Environmental evaluation, 5 (9.3 %)	Occupational evaluation, 3 (5.6 %)	Other, 2 (3.7 %)	None listed, 4 (7.4 %)
Exposure							
Metal exposure	Cobalt, 21 (38.9 %)	Chromium, 13 (24.1 %)	Mercury, 13 (24.1 %)	Lead, 8 (14.8 %)	Arsenic, 4 (7.4 %)	Copper, 4 (7.4 %)	Other, 5 (9.3 %)
Symptoms							
Symptom	Numbness/ paresthesias, 8 (14.8 %)	Rash, 4 (7.4 %)	Hemolysis, 2 (3.7 %)	Nausea/ vomiting, 2 (3.7 %)	Peripheral neuropathy, 2 (3.7 %)	Other, 8 (14.8 %)	Symptom not reported, 18 (33.3 %)
Related to exposure	Most likely related, 6 (11.1 %)	Unlikely related, 21 (38.9 %)	Unknown if related, 8 (14.8 %)	No response, 19 (35.2 %)			
Treatment							
Treatment given?	Yes, 8 (14.8 %)	No, 45 (83.3 %)	No response, 1 (1.9 %)				
Type of treatment	Chelation, 3 (37.5 %)	IV fluids, 2 (25 %)	Gastric lavage, 1 (12.5 %)	Prosthetic hip revision, 1 (12.5 %)	N-acetylcysteine, 1 (12.5 %)	Whole bowel irrigation, 1 (12.5 %)	Vitamin C, 1 (12.5 %)

*% total >100, more than one response possible for each