

CADMIUM POISONING

LAWRENCE H. COTTER, M.D.

AND

B. H. COTTER, M.D.

NEW YORK

CADMIUM is a metal which is being widely used in industry at the present time, particularly as a substitute for the scarcer metals. A silver-white, lustrous metal, so soft it can be cut with a knife, it melts at 321 C. and boils at 767 C. It is insoluble in cold hydrochloric acid or sulfuric acid. It is a constituent of many easily fusible alloys, solders and mercury amalgam. It is used in vapor lamps, photometry and electroplating. It appears in pigments as cadmium sulfide, a very durable yellow, and in cadmium selenide as a red fixative.

That cadmium is one of the more toxic metals is well known, and the clinical picture of acute cadmium poisoning is generally familiar to industrial physicians and toxicologists. The typical acute poisoning, starting with irritation of the throat and cough, goes on to severe, constricting pain in the chest and dyspnea associated with chills and prostration. Pathological findings are grossly those of pulmonary congestion and edema. Microscopically, one observes cellular infiltration, pneumonitis and hemorrhages. The typical poisoning is usually fatal.

Acute cadmium poisoning, however, does not present this classic picture in every case, and the cases in which it does not frequently go unrecognized. In many such cases the patient recovers without a diagnosis of cadmium poisoning having been made. Regardless of the precise clinical syndrome presented by patients with cadmium poisoning, little is known about the alterations in the blood chemistry and the metabolic processes characteristically associated with this condition. Information about these alterations would not only provide a broader picture of the toxicological action of cadmium absorbed into the body but it might be expected to provide preclinical evidence which if detected early would be invaluable for purposes of prevention.

It is the present purpose to discuss the changes in blood chemistry found in five workers exhibiting the less typical clinical manifestations of cadmium poisoning, and to consider the significance of these findings for purposes of diagnosis and prevention. All five workers were known to have been exposed to cadmium, and the cadmium absorbed into the blood and that excreted in the urine were measured quantitatively. Two of these workers were simultaneously exposed to lead and showed evidences of absorption and excretion of lead. However, since previous