[ID-P#112] Recent advances in the clinical management of intoxication by five heavy metals: Mercury, Lead, Chromium, Cadmium and Arsenic

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Metals are considered as the oldest toxins known to humans. The common toxic heavy metals (THM) include mercury, lead, chromium cadmium, and arsenic. As human exposure to THM increasingly causes systemic and organ complications, it is necessary to re-evaluate the current treatment strategies and review the recent advances in each toxic metal. Despite the current knowledge of the hazards of heavy metals, there is still a high occurrence of poisoning remains considerably high and highlighting the need for preventive and effective treatment. In this review, after an introduction, we briefly describe the routes of exposure, clinical features and prognosis of each metal poisoning. Then, review the different treatments for each metal with particular attention to recent advances in the treatment of both acute and chronic poisonings. The main antidotes for the application of all THM are chelating agents and chelation therapy has long been considered for the THM poisonings. New chelating agents have been introduced during the last decades and some of them successfully used in clinical practice. Dimercaptosuccinic acid (DMSA) known as succimer has been prescribed as a safe oral metal chelator in lead poisoning. Similarly, dimercapto-propanesulfonic acid (DMPS) has also revealed fewer side effects than the old chelating agents. The two are currently gaining increased acceptance among clinical toxicologists. However, there is no specific antidote for mercury poisoning. Dimercaprol is almost no longer used as an antidote of choice in the treatment of chronic THM poisoning. Comparison of clinical management of intoxication by the five heavy metals reveals similar treatment strategies to prevent more exposure, using chelating agents and to improve the antioxidant power. On the other hand, some of them require specific interventions to reduce the toxicity. Because of drawbacks in the application of commonly known chelating agents, treatment with bioactive compounds which have antioxidant and anti-inflammatory properties has been the subject of much interest in recent research. However, despite the promising results observed, clinical trials on their clinical therapeutic benefits need to be established to determine the efficacy and safety in humans. Still, the development of less toxic chelating agents is under investigation. Moreover, the development of orally administrable chelating agents for home health care would likely be of great interest for future research