



## MERCURY: A CASE REVIEW

Dr. John Dempster, ND

### Introduction

The topic of heavy metal toxicity and its effect on human health is one met with much discussion, controversy, and often misinformation. Yet, heavy metals have been in close contact to humans for thousands of years. Mercury's effects on human health have been known for centuries especially amongst the ancient Greeks, Romans, Chinese, and Hindus.<sup>1</sup> Although several adverse health effects of heavy metals have been known for a long time, exposure to heavy metals continues, and is even increasing in some parts of the world.

The main threats to human health from heavy metals are associated with exposure to lead, cadmium, arsenic and mercury. These metals have been extensively studied and their effects on human health regularly reviewed by international bodies such as the WHO.<sup>2</sup> Mercury for example, has been linked to a diverse range of chronic diseases, including: neurological disorders, chronic fatigue, auto-immune conditions, heart disease, and even certain cancers.<sup>3</sup> With this knowledge has emerged a stronger belief that Mercury and other heavy metals are indeed the root cause of many types of chronic illness commonly seen in our waiting rooms today. The following case study demonstrates how mercury may be involved in creating neurological symptoms that often fly beneath the traditional medical 'radar'.

### Case Presentation

BD is a 63 year old male who first came to my clinic presenting with symptoms of dizziness and fatigue. These symptoms had been constant for the previous two years but had been increasing in consistency. He also had three major bouts of dizziness in the prior eight months where he was affected severely enough that he was unable to get out of bed. He holds a demanding position in a prestigious corporation and has been told stress was the main cause of his symptoms for years (by both his GP and his private medical clinic). He has a history of mild/moderate hypertension and borderline high LDL values. As a result, BD's medical doctors had previously prescribed many

medications (see below). He had previously consulted with another ND, a TCM practitioner, and an osteopath all of whom diagnosed BD with 'adrenal fatigue'. While he admits work stress plays a large role in his life, he never believed this was the sole factor manifesting his symptoms and was referred to me to investigate further.

Initial visit vitals: BP 128/70, Pulse 68, Temperature 96.4

Physical exam: within normal limits (WNL), slight nystagmus.

ROS: nervousness/anxiety, frequent headaches, fatigue, stiff neck.

Medications prior to initial visit: Bisprolol (Beta blocker), Norvasc (Calcium channel blocker), Micardis (Angiotensin II receptor antagonist), Clonazepam (Benzodiazepine), Lipitor (Statin).

Supplements prior to initial visit: Juice Plus, 5-HTP, L-Carnitine, L-Arginine, DHEA, Dr. Wilson's Adrenal Support

The DDX list consisted of thyroid imbalance, anemia, hypoadrenia, possible adverse reaction to current Rx medications, cervical spine misalignment/nerve impingement, heavy metal toxicity, food allergy/sensitivity, and stress maladaptation. In order to assess if adrenal insufficiency was a causal factor, an adrenal hormone panel was ordered to confirm. Results revealed cortisol levels normal in AM and PM, but at low end of range during mid-morning and mid-afternoon, DHEA within normal limits. BD had imaging done on his cervical region, all WNL. Blood panels were run on TSH, Ferritin, MCV, MCH, MCHC, and RDW. AST, ALT, GGT, and Creatinine were also tested to establish liver and kidney function – all WNL. An IgG food allergy panel was also run and uncovered a high reaction to eggs, and moderate reaction to sugar and whey.

BD typically enjoys one to two glasses of wine during the week, and often a few more on weekends. He was placed on a diet to remove eggs and whey while reducing his alcohol consumption. A basic adrenal support protocol (B complex, CoQ10) was also implemented. During his first follow-up 30 days later, BD reported a slight change in energy but

UPDATE

EDITORIAL

CASE REVIEW

PRACTICE

RESEARCH

## MERCURY: A CASE REVIEW *continued*

no significant improvement with his dizzy spells. Further investigation revealed a history of multiple mercury fillings that had been getting replaced over the previous few years. In addition BD had received a full vaccination schedule as a child and had been receiving the seasonal flu vaccine from his GP for two years. BD was also an avid consumer of fresh fish averaging four to five meals per week of tuna/cod/salmon. During a brief discussion with BD of the potential links of mercury toxicity, a provocative urine toxic metal screen was ordered. DMSA (750 mg) was used orally as the provocative agent. BD's MD granted this prescription. Results revealed elevated levels of lead (14 ug/g – Normal <5), and highly elevated mercury levels (19 ug/g – Normal <3). Creatinine levels were assessed to be WNL.

BD was then prescribed Metalloclear (3 caps BID), and DMSA capsules (250mg TID) 3 days on, 11 days off. This cycle was repeated 6x for a total of 12 weeks before re-testing. During his second follow up three weeks later, BD reported a remarkable improvement with his dizzy symptoms after one week being on his chelation regimen. He and his wife both agreed that he had not felt this well in months. We continued his Metalloclear and DMSA program as well as further liver, kidney, and lymphatic support. Three months later his metals were re-tested using the same provocative urine challenge and revealed a significant drop in his mercury levels (6.2 ug/g). We set BD to continue his Metalloclear and DMSA program for another six cycles and to re-test in 12 weeks. This test revealed a further decrease in mercury levels (3.8 ug/g) and no return of his dizzy spells.

### Discussion

BD's case presents interesting findings employing chelation of mercury using a combination of effective and proven chelating agents. The element mercury exists as inorganic, elemental, or organic species. Routes of exposure and toxicity in humans vary according to the species of mercury involved. Mercury is a proven neurotoxin in very low doses, and has been documented in many cases of persistent dizziness<sup>4</sup> and other chronic concerns. In addition, mercury in combination with other toxic metals can create a synergistic toxic burden resulting in myriad symptoms. Some possible sources include dental amalgams,<sup>5</sup> certain vaccinations, environmental exposure and excessive consumption of fish/shellfish.<sup>6</sup> Measuring heavy metal levels in the urine is an accepted method for assessing the presence of a heavy metal burden in an individual.<sup>7</sup> The prevailing therapeutic option for mercury decontamination is chelation therapy (CT). CT involves the injection or ingestion of a chelating agent which binds with heavy metals, rendering them less chemically active.

Once bonded, the metal enters the bloodstream, where it is eventually excreted in the urine. Metallothionein (MT) is a natural chelator and a cellular protein. MT plays a crucial role in the chain of activities leading to the excretion of toxic metals. Metallothionein has been documented to bind a wide range of metals including cadmium, zinc, mercury, copper, arsenic, silver, etc. Metallation of MT was previously reported to occur cooperatively but recent reports have provided strong evidence that metal binding occurs via a sequential, non-cooperative mechanism. The observation of partially-metallated MT (that is, having some free metal binding capacity) suggest that these species are biologically important.<sup>8</sup> MT is the body's natural chelating agent and efficiently binds to several toxic metals, especially cadmium and mercury, for delivery to the liver or kidneys for conjugation and excretion.<sup>9</sup>

Meso-2,3-Dimercaptosuccinic acid (DMSA) is another effective chelator of both mercury and lead and attracts mercury due to its sulfhydryl bond.<sup>10</sup> Dosage of DMSA is based on body weight of patient. Administration of DMSA does require kidney function to be tested and monitored during treatment as the potential for toxicity exists. DMSA has an affinity to bind to certain minerals (i.e., zinc, potassium, magnesium). In order to prevent a mineral deficiency in these areas, BD was prescribed Ortho-Minerals (AOR), 3 caps BID.

### Conclusion

Mercury and its compounds are highly toxic at very low doses. Occupational exposure and environmental pollution are the major sources of hazard to human health. Metallic mercury evaporates at room temperature producing inorganic and organic compounds, and forms amalgams with many metals.<sup>11</sup>

Scientific evidence linking long-term exposure to heavy metals with a growing number of adverse health effects has been reported in peer-reviewed literature with increasing frequency. Increasing awareness of the effects of heavy metal toxicity combined with limited therapeutic options has created a market need for a safe and effective method to detoxify heavy metals without significant contraindications or side effects. Metallothionein and DMSA are two proven chelators that can be used safely in the effective removal of mercury and other metals. In the case of BD, these chelators seemed to be clearly helpful in lowering his mercury burden from a toxic level (19 ug/g) to a manageable level (3.8 ug/g). As a result, neurological symptoms associated with these elevated mercury levels diminished as well. Many chelation options exist for removal of mercury and other toxic heavy metals. It is important to assess the elimination pathways of each individual patient before a chelating agent is selected.

# MERCURY: A CASE REVIEW *continued*

## About the Author

Dr. John Dempster ND is the founder/director of The Dempster Clinic – Center for Integrated Medicine in Yorkville, Toronto. His practice focuses on functional and biological medicine to assess and correct individual terrain imbalances of his patients. John also utilizes parenteral therapy to help accelerate a healing response. He has a special interest in cancer, heart disease, hormonal conditions, and environmental medicine. Visit his website [www.drdepster.com](http://www.drdepster.com) if you would like further information on his practice. He can be contacted at 416-551-9577 or [drd@thedempsterclinic.com](mailto:drd@thedempsterclinic.com)

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