Review Article

Chelating Foods in Chronic Disease Treatment and Prevention

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ABSTRACT

As increasing numbers of patients present with chronic illnesses each year, healthcare has remained unable to resolve many of these issues' root causes, resorting to symptom management instead. For example, it is becoming increasingly clear that heavy metal toxicity is highly correlated with these conditions. Still, clinical care has focused more on pharmaceutical and surgical interventions than on trying to understand these underlying connections better. Because heavy metals are ubiquitous in modern life, exposure risk is high for nearly everyone. While chelation therapy has a long history and remains an effective method of removing heavy metals from the body, various foods have also been shown to possess powerful chelating properties. In light of these realities, not only is it incumbent upon physicians to make a heavy metal testing standard protocol for certain conditions, but incorporating a diet emphasizing chelating foods can provide powerful support to existing treatment and act as a preventative measure against bioaccumulation and its associated diseases.

INTRODUCTION

Seven of the ten leading causes of death in the U.S. are non-communicable chronic diseases.[1] As cases continue to rise, patients are being diagnosed at younger ages, leaving them to spend more years fighting illness rather than enjoying their lives.[2] In fact, increasing chronic multi-morbidity among women in their 30s has led some researchers to call for strategic chronic disease interventions in childhood to ensure long-term health and protect future generations.[3] This troubling trend has made it clear that chronic disease cannot be entirely or even explained mainly by genetics and has forced researchers to broaden their perspective. Some now suggest that while genetics can predispose a person to chronic disease, one such factor is exposure to toxic metals. 70 to 90% of disease risks are due to environmental factors.[4]

HEAVY METALS AND CHRONIC DISEASE

There are 21 toxic metals in total; of these, arsenic, cadmium, lead, nickel, and mercury comprise the most exposure.[5] In the body, they interfere with enzyme function by binding with sulfhydryl groups in proteins. Most often, they accumulate in the brain, bone, liver, and kidneys, resulting in neurological damage and organ dysfunction.[6]

Heavy metals have long been implicated in chronic diseases, including cardiovascular disease and stroke[7], neurodegenerative diseases[8], kidney disease[9], and cancer.[10] They have also been found to play a causative role in liver disease[11], autoimmune disease[12], endocrine disruption[13], dysbiosis[14], and even mental illness[15]. This has much to do with heavy metals' ability to create inflammation[16], DNA damage[17], oxidative stress, and suppress antioxidant production.[18]

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EXPOSURE RISKS

Heavy metals are ubiquitous, and avoiding exposure is impossible. It's not just industrial workers exposed to heavy metals, but the general population through the air pollution and water runoff their facilities create.[19] Pesticides, herbicides, and caustic fertilizers also contain heavy metals[20], which vegetables can take up through their root systems from contaminated soil.[21] Likewise, heavy metals have been found in many products, including cosmetics,[22,23] chocolate bars,[24] seafood,[25] baby food,[26] protein supplements,[27] rice,[28] ceramic cookware,[29], and many others.

FIGURE 1:
Heavy metal testing: a standard protocol for certain conditions

CHELATION THROUGH DIET

While intravenous chelation therapy is an effective treatment for removing heavy metals and cardiovascular, neurodegenerative, and kidney diseases,[30] plants have long been known to produce chelating agents.[31] Their effectiveness has convinced public health experts to recommend a diet rich in such foods and nutrients to support continuous heavy metal removal for disease prevention and body rebuilding.[32] Some of these include:

- Cilantro (Coriandrum sativum) significantly reduces lead deposits in the kidneys and bones,[33] as well as the liver[34] and brain,[35] while reversing functional and structural damage.
- Chlorella green algae have an outstanding ability to bind to cadmium and arsenic[36] while also producing significant reductions in cumulative mercury in the brain and kidneys through excretion via urine and feces.[37]
- Foods high in sulfur, such as Alliums (garlic, onions, shallots, leeks), are powerful chelates. Garlic (Allium sativum) has shown a remarkable ability to bind to cadmium, methylmercury, and phenylmercury in reducing accumulation in the liver, kidneys, bone, and testes. Its protective effect was said to be superior to several medical chelating agents and similar to others, such as 2,3-dimercaptosuccinic acid (DMSA).[38] At the same time, garlic has been shown to preserve immune function by protecting leukocytes against mercury-induced damage[39] while producing considerable reductions in the lead.[40]
- Selenium-rich diets have been shown to prevent mercury toxicity and reverse some of its effects, particularly in the brain and neuroendocrine tissues. Selenium is a powerful chelating agent because mercury's binding affinity for selenium is nearly one million times higher than sulfur.[41]
- Curcumin, a compound of the spice turmeric, has scavenging and chelating properties that protect the liver from damage induced by cadmium, chromium, copper, lead, and mercury while protecting glutathione from depletion and preventing mitochondrial dysfunction.[42]
- Quercetin, a flavonoid, significantly reduced cadmium levels and related kidney damage. Its chelating power was further enhanced when accompanied by vitamins C and E.[43]
- Alpha-lipoic acid has been shown to greatly reduce lead levels and oxidative damage,[44] while folate has the same effect as arsenic.[45]

CONCLUSION

Because heavy metal exposure is unavoidable in modern life, evidence strongly supports periodic testing and a diet high in chelating foods as part of a disease prevention or treatment protocol.

AUTHOR DISCLOSURES:

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