CASE REPORT

Integrative Medicine Approach To Peripheral Neuropathy—Avoiding Pitfalls Of Ineffective Current Standards In Assessing Chronic Low-Grade Mercury Toxicity And Functional Musculoskeletal Lesions

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Abstract

Introduction: Mercury is a toxic metal that exists in elemental, inorganic, and organic states. Humans are exposed to mercury through industrial sources, consumption of seafood, or healthcare. Over time, this compound can accumulate in the body and cause symptoms. The authors of this study report a case of mercury toxicity and the detoxification treatment regimen provided to the patient from a functional medicine standpoint.

Case presentation: The patient is a 62-year-old woman of Mexican descent with a past medical history of hypertension, insulin resistance, hyperlipidemia, and anxiety disorder who presented, after visits with multiple allopathic physicians, with worsening neuropathic pain, fatigue, short term memory loss, and RUQ abdominal pain. She was found to have 10 aged mercury amalgams and elevated blood levels of inorganic mercury. Amalgam removal was recommended, in addition to dietary changes, a natural supplement regimen, and manual/physical therapy. After following the treatment for one year, the patient experienced a 70% decrease in total blood mercury levels and a dramatic improvement of all her symptoms.

Discussion: This patient's chronic mercury toxicity from dental amalgams was effectively treated using a functional medicine approach to care. More studies are needed to compare pharmacologic versus supplemental chelation.

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Introduction

Mercury has been used historically for its medicinal properties, including its use as a diuretic, an antibacterial agent, and as a laxative.[1] It was not until the 1800s that it was discovered that chronic mercury exposure has devastating effects on the human body. Mercury exists in multiple forms, including in elemental form as a metal or vapor, inorganic mercurous (Hg_2^{++}) or mercuric (Hg^{++}) salts, or as an organic compound (ethyl, methyl, alkyl, and phenyl mercury).[2] Each of these forms of mercury have different toxic effects on the body, which also vary with concentration and duration of exposure. Elemental and methylmercury, for example, readily cross the blood brain barrier, while inorganic salts usually do not.[2] According to the World Health Organization, sources of mercury toxicity include industrial services, consumption of contaminated aquatic organisms, health care related exposures (e.g., mercury-containing amalgams) and certain traditional practices. Mercury pollution in large waterways leads to methylmercury contamination of aquatic organisms, and human toxicity upon consumption of these organisms. As for healthcare related exposures, dental amalgams (often comprised of up to 50% elemental mercury) release mercury vapor which is inhaled and eventually deposited as methylmercury over many years, often leading to clinical manifestations of chronic mercury toxicity.[2]

Over time, symptoms of chronic mercury exposure can progress from paresthesia, decreased sense of taste or hearing, and fatigue to headaches, hypertension, and immune dysregulation, and furthermore to severe symptoms such as tremors, anemia, psychoses, renal failure, or Alzheimer's disease.[3,4] Although there is an understanding of the toxic effects of mercury exposure, there are limited evidence-based studies that explore its clinical onset and treatment methods. The authors of this

Table 1.

	Urine Results (ng/mL) 3/23/2017	NA	%Change	Hair (ng/g) 3/23/2017
Methylmercury— MeHg	<0.005	NA	NA	NA
Inorganic Mercury— Hg^{II}	0.756	NA	NA	NA
Sum— HgT	0.756	NA	NA	2136

Table 2.

	Results (ng/mL) 3/23/2017	NA	% Change	Reference Ranges QS n=1011; CDC n=1928 Source	Range	Average	Percentile 50th	75th	90th	95th
Methylmercury— MeHg	11.3	NA	NA	QS	<0.003 to 23.3	1.95	1.2	2.9	5.4	7.4
Inorganic Mercury— Hg^{II}	0.495	NA	NA	QS	<0.007 to 1.75	0.139	0.10	0.19	0.32	0.46
Sum— HgT	11.8	NA	NA	CDC	0.038 to 9.96	0.833	0.7	1.7	3	4.6

Blood Reference Values: Quicksilver Scientific (QS) Data represents 1011 males and females that have utilized our testing. CDC data represents 1928 females, ages 16 to 49
QS blood Hg concentrations are higher that CDC because QS analyzes blood a population that already suspects mercury toxicity.
Data and Analysis Information: Mercury speciation was performed at Quicksilver Scientific, and all values are in concentrations of ng Hg per mL of blood

study report a case of both inorganic and organic mercury toxicity in a patient treated at an integrative medicine clinic affiliated with a large academic health center and the detoxification treatment regimen. The diet, supplement regimen, and other aspects of her treatment were derived from a functional medicine standpoint, the branch of integrative medicine which allows for a systems-based approach to healing and considers all factors of the patient's health and lifestyle.

Case Presentation/Presenting Concerns

The patient is a 62-year-old woman of Mexican descent with a past medical history of hypertension, insulin resistance, hyperlipidemia, vision changes, and "life-long" anxiety disorder. She presented to the clinic with decades-long, worsening neuropathic pain in her left lower extremity, chronic fatigue, worsening short term memory, and chronic right upper quadrant abdominal pain. The patient had several prior visits to allopathic providers to investigate her symptoms, but, despite various attempts at treatment, her symptoms remained. This led to her pursuit of an integrative medicine approach for diagnosis and treatment of her symptoms.

Upon initial evaluation, the patient was found to have at least ten large oxidized or dated mercury amalgams in her mouth, and a HgbA1c of 5.8%, placing her in the pre-diabetic range. These findings, in conjunction with her hypertension, long standing psychiatric symptoms, and neuropathy, were cause for high clinical suspicion of mercury toxicity.[5]

To confirm this diagnosis, the QuickSilver Scientific Mercury Tri-Test was conducted to evaluate the patient's mercury levels. The results of this test (see Table 1 and Table 2) led to the diagnosis of toxic effects of chronic mercury exposure.

Therapeutic Intervention and Treatment

Informed consent was obtained from the patient. Per her lab results, which were discussed with the patient at her 3-month follow-up visit, the patient had elevated levels of inorganic mercury, of which her ten large mercury-containing amalgams were likely the source. As such, she was recommended to have her amalgams removed as soon as possible and was given a referral to an experienced holistic dentist for safe removal. The patient's amalgams were removed shortly thereafter.

With such a high suspicion for mercury toxicity at her initial visit, the patient was recommended to make some immediate modifications to her diet and started on a supplement regimen. Her diet was modified by increasing the amount of cilantro consumed each week, as this has been found to enhance mercury excretion, particularly after dental amalgam removal, although there is limited evidence reported.[6,7] She was instructed to add about 50 grams of cilantro (half a typical bundle) to her diet at least two to three times per week. In addition, she was recommended to limit her fish/seafood consumption to only those which are low in mercury, such as salmon, sardines, haddock, tilapia, shrimp, clams, oysters and mussels, and no more than two servings per week.

As for her supplement regimen, she was recommended to take Metabolic Synergy (Designs for Health), a multivitamin containing high dose alpha lipoic acid known to assist in recycling of glutathione.[8] She was recommended to take Hepatatone Plus (Designs for Health), a product containing *N*-acetyl cysteine (NAC),

Timeline.

CC: 62-yo female with a history of hypertension, insulin resistance, hyperlipidemia, hip and bladder pain, short term memory loss, vision changes, and anxiety p/w worsening neuropathic pain in left lower extremity, right upper quadrant abdominal pain, and fatigue. This timeline reports functional medicine, physical therapy and oral treatment, and progress.

Dates

Clinical Appointments
Shading: Blue – Functional Medicine; Orange – Dental treatment; Purple – PT; Pink- Clinical Tests

2016

Attempted Therapies: Mind Body Stress Reduction therapies helped with chronic stress, but not hypertension or pain.

02/2017

Initial Consult
PE: Hypertension (BP 148/90), chronic anxiety, insulin resistance, hip and leg pain, 10 large mercury amalgams
Recommendations:
- Diet: increase cilantro in diet and limit consumption of seafood
- Supplements:
  - Metabolic Synergy (Designs for Health)
  - Wright Salt (Ayush Herbs)
  - Carditone (Ayush Herbs)
  - Vitamin D consistent
- Lab tests: Quicksilver Mercury TriTest, Doctor's Data Test (functional medicine lab test)

05/2017

Follow-Up 1: Patient reports no major changes.
PE: Grossly unchanged from previous visit
Lab results: Quicksilver Mercury TriTest reports inorganic mercury toxicity
Diagnosis: Toxic effect of inorganic mercury
Recommendations:
- Continue diet and supplement regiment
- Add additional supplements:
  - Hepatatone Plus (Designs for Health)
  - Metal X Synergy (Designs for Health)
- Use a sauna twice/week
- Use an organic coffee enema
- Dry skin brushing before showering
- Use a water filter
- Referral to holistic dentist for amalgam removal
- Lab tests: Repeat Quicksilver Mercury TriTest 3 Months after last amalgam removal

06/2017

Restorative Dental Treatment: Patient received mercury amalgam removals.

09/2017

Repeat Quicksilver Mercury TriTest (3 months post amalgam removal) showed significant decreases in inorganic, organic and total mercury levels.

11/2017

Follow-Up 2:
Patient reports significant improvements in neuropathic pain in LLE and RUQ abdominal pain. Patient also reports an increase in her energy level and improvement in short term memory and vision changes. She experienced some persistent pain in her hip, right flank, sacrum and bladder.
PE: Right shoulder was lower than left, unequal hips.
Recommendations:
- Continue previous regimen
- Referral to physical/manual therapy for persistent pain

12/2017

Follow-Up 3:
PE: Blood pressure decreased to roughly 138/80
Lab results: Cholesterol and HbA1c still high, but lower than previous year.
Recommendations:
- Continue previous regimen
- Add more unsaturated fats to diet, (ie olive or avocado oil)
- Add red yeast rice to diet as a natural form of a statin
- Lab tests: Urine metal tests to be performed in 6 months

02/2018

Initial Consult: Physical Therapy
PE: Patient presents with abnormal gait, pain at right flank, bladder, left hip and LLE.
Recommendation: Follow plan designed by PT to decrease stress throughout system, increase flexibility and decrease pain.

Outcome: 62-yo female with a history of HTN, insulin resistance, hyperlipidemia, hip and bladder pain, short term memory loss, vision changes, and anxiety p/w worsening neuropathic pain in LLE, RUQ abdominal pain, and fatigue, found with ten large mercury-filled amalgams leading to mercury toxicity, showed improvement in all symptoms and decreased mercury blood levels after one year of treatment: functional medicine, restorative dental treatment, and PT.

Table 3

Supplement	Ingredients	Dose	Date Recommended
Metabolic Synergy (Designs for Health)	Serving Size: Three Capsules Amount Per Serving: 1500IU Vitamin A (from Palmitate and Mixed Carotenoids from Palm Tree Fruit), 250mg Vitamin C (as Ascorbic Acid), 200IU Vitamin D (as Cholecalciferol),14 IU Vitamin E (as d-alpha Tocopherol), 38mg Thiamin (Vitamin B-1) (as Thiamin HCl and Benfotiamine), 13mg Riboflavin (Vitamin B-2), 25mg Niacin (Vitamin B-3) (as Niacinamide), 25mg Vitamin B-6 (as Pyridoxine HCl and Pyridoxal-5-Phosphate), 200mcg Folate (NatureFolate™ blend), 500mcg Vitamin B-12 (as Methylcobalamin), 2000mcg Biotin (as d-Biotin), 25mg Pantothenic Acid (as d-Calcium Pantothenate), 37mcg Iodine (as Potassium Iodide), 50mg Magnesium (as Di-Magnesium Malate), 15mg Zinc (as Zinc Bisglycinate Chelate), 100mcg Selenium (as Selenium Glycinate Complex), 2mg Manganese (TRAACS® Manganese Bisglycinate Chelate), 250mcg Chromium (TRAACS® Chromium Nicotinate Glycinate Chelate), 50mcg Molybdenum (TRAACS® Molybdenum Glycinate Chelate), 100mg Potassium (as Potassium Glycinate Complex), 300mg Alpha Lipoic Acid, 300mg Taurine, 250mg Inositol, 100mg Green Tea Extract (Camellia sinensis) (leaves) [standardized to contain 98% polyphenols, 45% EGCg] , 100mg Carnosine, 82mg High Gamma Mixed Tocopherols (as d-gamma, d-delta, d-alpha, d-beta), 100mcg Vanadium (TRAACS® Vanadium Nicotinate Glycinate Chelate) Other Ingredients: Cellulose (capsule), silicon dioxide, vegetable stearate.	3 capsules once per day, 5 days per week	Feb 2017
Hepatatone Plus (Designs for Health)	Serving Size: Four capsules Amount Per Serving: 600mg N-Acetyl-Cysteine, 500mg Milk Thistle seed (Silybum marianum) [standardized to contain 80% silymarin], 500mg Reishi Full Spectrum (Ganoderma lucidum, Ganoderma applanatum) (mycelium, fruiting body, primordia, spores and extracellular compounds), 500mg Cordyceps (Cordyceps sinensis) (mycelium) [standardized to contain 8% cordycepic acid and 0.28% adenosine] (from soy), 300mg Chinese Skullcap Extract (Scutellaria baicalensis) (root) [standardized to contain 30% flavones], 250mg Schisandra Extract (Schisandra chinensis)(fruit), 250mg Burdock Extract (Arctium lappa) (root) Other Ingredients: Microcrystalline cellulose, vegetable stearate.	2 capsules twice per day, 5 days per week	May 2017
Metal X Synergy (Designs for Health)	Serving size: Six capsules Amount per serving: 1g Dietary Fiber, 120mg Sodium, 130mg Potassium, 1.5g Modified Citrus Pectin (as PectaSol-C®), 1g Organic Chlorella-broken cell wall (Chlorella regularis)(whole plant), 900mg N-Acetyl-L-Cysteine, 750mg Modified Alginate Complex (as Algimate®), 400mg Garlic (Allium sativum)(bulb), 200mg L-Glutathione (reduced), 200mg Alpha Lipoic Acid Other ingredients: Cellulose (capsule), microcrystalline cellulose, vegetable stearate, silicon dioxide	3 capsules twice per day, 2 days per week, between meals	May 2017
Carditone (Ayush Herbs)	Serving Size: One capsule Amount Per Serving: 200mg Magnesium (as aspartate), 350mg Proprietary Blend (Rose Powder, Boerhaavia diffusa, 100mg Paval (Indian Coral) (Convolvulus Pluricaulis), 100mg Terminalia Arjuna, 100mg Tribulus Terrestris, 50mg Rauwolfia serpentine, 25mg Rosa Vinca Other ingredients: Dicalcium phosphate, Stearic acid, Magnesium stearate, and silicon dioxide	1 capsule twice per day	Feb 2017
Wright Salt	Serving Size: as desired 324mg Sodium, 54 mcg Iodine Other Ingredients: Sodium chloride, Pottasium chloride, Magnesium sulphate, Lysine hydrochloride, Silicon dioxide, Zinc chloride, Copper glucinate, Selenium and Potassium iodide.	Replace household salt with this product	Feb 2017
Vitamin D	Serving Size: 1 capsule Amount Per Serving 2000IU Vitamin D3 (as cholecalciferol) Other Ingredients: Rice Powder, Vegetable Cellulose Capsule, and Leucine.	Take home vitamin D tables more consistently (daily). Can replace with this if needed.	Feb 2017

Table 4.

	Urine Results (ng/mL) 9/21/2017	3/23/2017	%Change	Hair (ng/g) 9/21/2017
Methylmercury— MeHg	0.007	<0.005	NA	NA
Inorganic Mercury— Hg^{II}	1.25	0.756	65	NA
Sum— HgT	1.26	0.756	66	3661

Table 5.

	Results (ng/mL) 9/21/2017	3/23/2017	% Change	Reference Ranges QS n=1011; CDC n=1928 Source	Range	Average	Percentile 50th	75th	90th	95th
Methylmercury— MeHg	3.46	11.3	-69	QS	<0.003 to 23.3	1.95	1.2	2.9	5.4	7.4
Inorganic Mercury— Hg^{II}	0.135	0.495	-73	QS	<0.007 to 1.75	0.139	0.10	0.19	0.32	0.46
Sum— HgT	3.59	11.8	-70	CDC	0.038 to 9.96	0.833	0.7	1.7	3	4.6

Blood Reference Values: Quicksilver Scientific (QS) Data represents 1011 males and females that have utilized our testing. CDC data represents 1928 females, ages 16 to 49. QS blood Hg concentrations are higher that CDC because QS analyzes blood a population that already suspects mercury toxicity.
Data and Analysis Information: Mercury speciation was performed at Quicksilver Scientific, and all values are in concentrations of ng Hg per mL of blood

which is a known glutathione (GSH) precursor and mercury mobilizer, milk thistle, and other liver supportive nutrients. She was also recommended to take Metal-X-Synergy (Designs for Health), a product which provides several non-pharmacological gut heavy metal binders such as modified citrus pectin, chlorella, and additional amounts of NAC and glutathione. Glutathione is known to be a key nutrient to prepare mercury for excretion. In fact, glutathione is essential in detoxification of all heavy metals.[7] Table 3 provides a complete list of all vitamins and supplements which the patient was recommended to take. To optimize the removal of toxins from her body, the patient was also recommended to use a sauna twice per week for 10-15 minutes, and to take a shower immediately afterwards, in order to wash off any toxins.[9] In addition, she was told to switch to filtered water only, to ensure that there was no mercury or lead in her drinking water. The patient was also given the recommendations to utilize an organic coffee enema and to do dry skin brushing before showering for additional toxin removal.

Follow-up and Outcomes

Six months after the initiation of the patient's integrative treatment regimen, and three months after her mercury-containing amalgams were removed, the QuickSilver Scientific Mercury Tri-Test was repeated. The results showed significantly decreased blood mercury levels, along with substantially increased urine excretion of inorganic mercury (Table 4 and Table 5). In addition to these lab findings, within 8 months of the removal of her amalgams, the patient reported nearly complete resolution of her neuropathy symptoms, and improvements in her energy, short term memory, vision, and abdominal pain.

After her treatment, the patient had some persistent symptoms, including hip pain, some persistent abdominal pain, and a sensation of tension in her bladder. In order to continue the patient's care and address these lingering symptoms, it was recommended that she begin physical therapy. As a part of this comprehensive integrative approach, the patient was referred for evaluation by a Doctor of Physical Therapy with 16 years of clinical experience and a certification in manual therapy.

At the time of the evaluation, the patient reported right-sided flank pain and longstanding sacral and bladder pain that had started to improve following the mercury protocol. She experienced tension and pain at her left posterior hip region when needing to urinate. Pain was present in her lumbar spine and left posterior hip and extended down her left lower extremity to her foot (5/10 at worst, 2/10 at best on a visual analog scale with 0 indicating "least possible pain" and 10 indicating "worst possible pain"). The patient also reported unrelated medial knee pain that began during athletic activities two months prior to the physical therapy evaluation and was addressed separately.

Findings from the objective examination included palpable tension and decreased fascial glide in the right upper quadrant of her abdomen that produced pain in her left lower extremity. The patient showed notable restrictions of her C-section scar tissue and fascial restrictions around the region of her bladder. Posterior to anterior pressure at the spinous process of her L5 vertebrae in the prone position also reproduced her left lower extremity pain. She had decreased left hip range of motion into flexion, abduction, and internal rotation, with tightness and tenderness at her piriformis, gluteus maximus, and gluteus medius muscles.

Physical therapy interventions included muscle energy technique to mobilize the lower thoracic spine and lumbar spine as well as mobilizations of her left hip in

multiple planes of movement.[10] Fascial releases were completed to the abdominal right upper quadrant and through her abdomen, targeting restrictions surrounding her liver, gallbladder, common bile duct, and bladder. Releases were completed to her C-section scar tissue[11] and deep endopelvic fascia. Soft tissue mobilization was completed to her iliacus muscle and the abdominal portion of her psoas muscle.

The patient was educated on appropriate stretches to her piriformis and quadratus lumborum, and she was instructed on strengthening exercises for her gluteal muscles. The lumbar "pelvic clock," a Feldenkrais technique involving supine hooklying lumbar flexion, extension, and diagonal movements, was used to facilitate normalized movement patterns at her lumbar spine and pelvis. She was also instructed in diaphragmatic breathing and gentle self-abdominal releases. Functional retraining was provided, including addressing appropriate muscle activation, positioning and movement patterns during yoga, and activities of daily living.

The patient was seen for 7 visits of physical therapy, at a treatment frequency of once every week to every other week, over the course of 2 months. Each session lasted 60 minutes.

On her last visit to physical therapy, the patient reported full resolution of all right-sided flank pain, bladder pain, and sacral pain. She no longer had pain or an abnormal sensation in her gluteal region when her bladder was full. Her lumbar and left hip pain had decreased from 5/10 to 0.5/10 at worst. She showed an improved lumbar range of motion, normalized hip range of motion, and reduced restrictions throughout her abdomen. Her pain did not exceed 0.5/10 upon waking in the morning, and she no longer experienced pain when sitting or doing yoga.

Discussion

This patient suffered from mercury toxicity resulting from dental amalgams as her primary known source of exposure. Utilizing an integrative/functional medicine approach, the patient's symptoms, which included neuropathy, abdominal pain, memory loss, fatigue, and hypertension, were resolved after safe removal of the amalgams, dietary modifications, the addition of natural supplements, and manual/physical therapy. The integrative approach allowed for a 70% decrease in total blood mercury levels, a 66% increase in urinary excretion, and a 71% increase in excretion through hair follicles over a period of 6 months.

Dental amalgams are the second most common source of mercury exposure in humans, with seafood consumption being the primary source.[2] Over time, vapors from the amalgams are released within the mouth and inhaled, leading to chronic exposure. Once this patient's source of exposure was identified, it was clear that the most important step was to remove the source, as several studies have shown that removal of amalgams significantly improves symptoms, including abdominal discomfort, paresthesia, and fatigue.[5,12] It is vital to ensure that a well-trained environmental dentist removes the amalgams to prevent further inhalation of mercury vapors.[5] Similarly, in order to prevent additional exposure, the FDA recommends limiting consumption of seafood like shark, swordfish, and tuna, which we also recommended to our patient.

In Western medicine, dimercaptosuccinic acid (DMSA) is often used as a chelating agent for mercury toxicity, and has been shown to increase the amount of mercury excreted in patients with high levels.[2,13] Some adverse effects of this and similar medications, such as dimercaptopropane-1-sulphonate (DMPS), include removal of important nutrients and minerals, GI discomfort, and elevated liver enzymes.[14] This treatment was considered for our patient only as a last resort if needed. Although the literature on the use of cilantro as a chelating agent is limited, it has been described as one of the few chelating agents which can penetrate the CNS.[3] Cilantro can be used to displace metals like mercury, aluminum, and lead from CNS cells into the periphery, which allows for more efficient urinary excretion.

While DMPS is known to have high affinity to mercury,[7,13] its use is limited by frequent intestinal side effects and cost. Compounded cost of DMPS could be $15-20/day versus the above supplement approach, which was around $5/day. While in this specific clinic, one functional medicine provider used a variety of different chelating agents and natural binders, the personal choice of what product(s) to select for a given patient often remains a subtle art rather than a specific evidence based, cost effective approach. As general rule, we use more gentle, non-pharmacological binders with older patients and/or when a slower course of treatment is preferred. It is clear that what is needed is a side by side randomized comparison of different pharmacological and supplements-based chelators. Studies like this may be valuable for the field as it clarifies relative efficacy of these products, and may help to guide clinicians and the public of best practices regarding heavy metal detoxification regimens. Until such time, one can argue that any approach that uses a safe and reasonably efficacious treatment strategy can be applied based on multiple factors outlined above.

While this case presents rather usual practices for functional medicine treatment of neuropathic pain, the addition of manual/physical therapy, which ultimately resolved nearly all remaining pain, adds a unique angle. While the exact etiology of this patient's pain is not clear, we do speculate that mercury toxicity likely caused changes in muscular, nervous, and fascial tissue, as well as in mitochondrial function. These changes likely contributed to restrictions that caused pain, altered movement patterns and increased strain throughout her musculoskeletal system as well as her viscera. The changes likely led to decreased energy production, resulting in weaker muscles that were more prone to micro-trauma and functional

weakness.[15] While mercury detoxification certainly improved cellular function in this patient, careful manual evaluation, treatment, and muscular re-education was essential in re-establishing healthy musculoskeletal and nerve function in multiple body areas.[16]

One of the limitations of this case is the inability to distinguish the effectiveness of each aspect of the patient's treatment regimen individually. We do not have numerical values for the decrease in the patient's blood mercury as a result of amalgam removal compared to the addition of cilantro and supplements. Future exploration may determine the effectiveness of these additional treatments.

The inability to identify which parts of the treatment are most efficacious in a given patient is an issue that is often heavily critiqued by biomedical researchers, often leading to the inability to obtain serious NIH and other grants. In our opinion, this is unfortunate as it leaves patients without possibly effective treatment options that are not only cost effective, but safer than most current treatment options. For example, this patient had been suffering with her chronic pain syndrome for decades, and she was prescribed a variety of medications, none of which were helpful and, at times, caused adverse side effects. While many of her previously prescribed medications were covered by her insurance, the overall cost of her care was substantially more expensive when compared with her integrative medicine treatment. Although the entire course of her integrative medicine treatment cost the patient thousands of dollars, this led to permanent problem resolution in under 12 months, with no further medical care needed.

Patient Perspective

It is also important to note that this patient, prior to her functional medicine and physical therapy regimen, endured years of treatment, with little to no benefit, and quite possibly, adverse effects, despite paying high medical fees with the expectation of improvements in her health. She states, "I am upset because despite the fact that mercury toxicity is a known cause of hypertension, the physicians I saw […] just wanted to me to take pills to mitigate my symptoms without elucidating the cause. I could have lowered by blood pressure symptoms with pills. This would not only have exposed me to severe side effects, but more importantly, would have left unaddressed the underlying cause, mercury toxicity. Had this mercury toxicity continued to be unaddressed, I would have faced numerous health risks…I have concluded that these physicians just treat symptoms and are unwilling to take the time to think of their patients' health as a whole system. When I look back…I see missed opportunities for those physicians to think a bit out of the box and move beyond their basic checklist. I also see a negative impact on my health and quality of life. Many thanks [to her functional medicine and physical therapy providers] for helping me to restore my health and my quality of life. I feel so much healthier and stronger than I did before…"

Such unfortunate lack of interest from the allopathic profession, despite clear and objective data demonstrating the rationale for treatment of the underlying cause of symptoms such as hypertension, in addition to the patient's significant improvement, suggests that the amount of bridging education required is large, and likely will not be easy going forward.

Conclusion

The patient discussed here experienced significant improvement in her symptoms and a better quality of life as a result of an integrative medicine approach to her treatment, which occurred after years of unsuccessful allopathic physician visits. This case demonstrates that an integrative approach to treatment of mercury toxicity is an effective way to decrease blood mercury and increase mercury excretion, although additional studies are needed to further explore the impact of cilantro and supplements individually.

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