CASE REPORT

Managing Hashimoto's Thyroiditis Through Personalized Care: A Case Report

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ABSTRACT

Hashimoto's thyroiditis (HT) affects more than 14 million individuals in the United States, most of them women. Thyroid replacement therapy has long been the foundation of medical treatment for HT; however, recent research supports a role for nutritional approaches. This case report describes the management of a 34-y-old female with HT who declined thyroid replacement therapy and was successfully managed for a period of 5 mo. The patient was advised to follow a phytonutrient rich diet (eg, berries); avoid sensitive foods (gluten and soy); and consume quality fats, fermented foods, and filtered water. Nutritional supplementation of vitamins (B complex, D_3), α-lipoic acid, coenzyme Q_{10}, magnesium, omega-3 oil (DHA/EPA), and probiotics were used in conjunction with an herbal tincture. (*Altern Ther Health Med.* 2018;24(3):56-61.)

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Hashimoto's thyroiditis (HT) has no single etiology but is generally considered a disease that develops from the complex interplay of genetics, environment, diet, and lifestyle.[1] It is commonly diagnosed by measuring antithyroglobulin antibody, antithyroid microsomal antibody,[2] and thyroid peroxidase antibody. Occasionally, nutritional interventions play an integral role in the support for HT. For example, high-dose thiamine supplementation has been found to mitigate the fatigue in patients receiving levothyroxine,[3] and supplementation with selenium or vitamin D may help to decrease antithyroid antibodies.[4,5] In addition, deficiencies of iron, vitamin B_{12}, copper, zinc, and selenium have all been implicated in thyroid dysfunction.[2,6] Ultimately, all HT patients have a unique set of factors playing into their autoimmunity. HT may develop as a result of underlying dysfunction due to causes such as celiac disease,[7] ultrastructural changes in enterocytes in nonceliac HT,[8] or an untreated chronic infection.[9] Therefore, a functional multifaceted regime that identifies and removes sensitive foods from the diet, supports the health of the gastrointestinal tract, provides nutrient and botanical nourishment for structural repair, and encourages lifestyle modifications for stress management may be an effective strategy for addressing HT. This case report was written following the CARE guidelines.[10]

CASE PRESENTATION

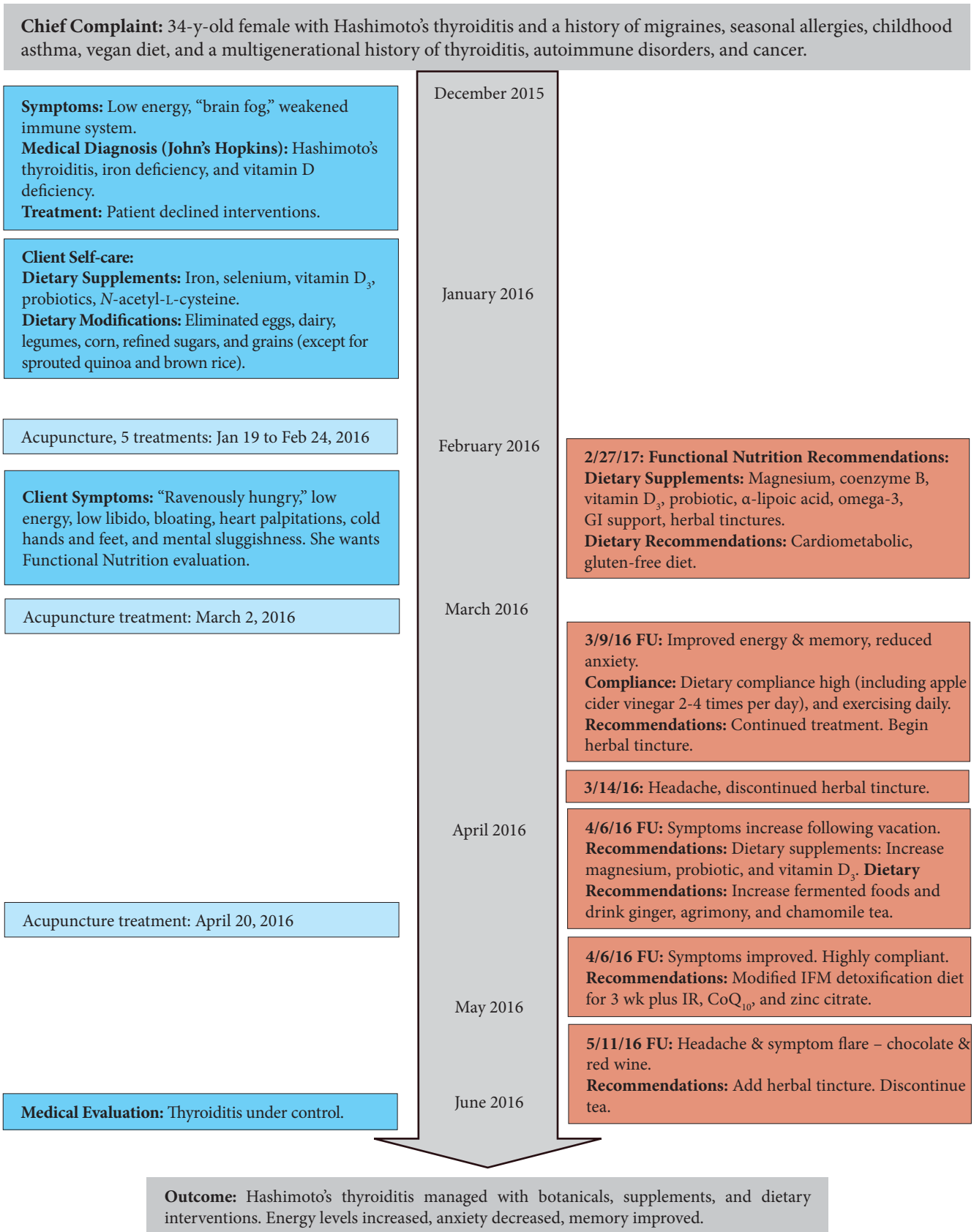
Presenting Concerns

The client was a 34-year-old female who was diagnosed in December 2015 through Johns Hopkins Medical Center with HT, iron deficiency, and vitamin D deficiency. She was married with a young child, was a full-time graduate student, and was employed part-time in a wellness clinic. When she sought support at the Functional Nutrition Practice in February of 2016, she reported feeling "ravenously hungry," having low energy, low libido, bloating, heart palpitations, cold hands and feet, and mental sluggishness.

History

The client reported that she began to "feel off" in May 2015 (shortly after her best friend suffered a stroke). However, she suspected that some of her imbalance began approximately 2 years after her child was born, because at that time she would vomit often, wake up exhausted, and experience severe multiday migraines that brought her to the emergency room where she would receive injections (she did

Figure 1. Timeline



Abbreviations: FU, follow-up; IFM, Institute for Functional Medicine; CoQ_{10}, coenzyme Q_{10}.

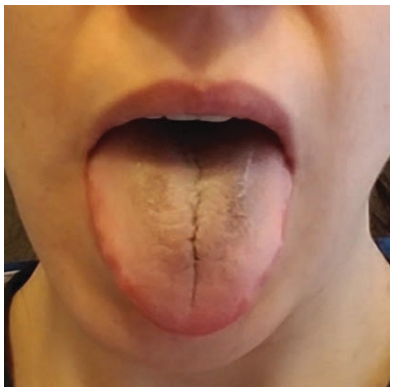
not specify the medication that she received). She described her menstrual cycle as regular with severe cramps. She has a family history of drug abuse, hyperthyroidism, Hashimoto's, type 2 diabetes, Crohn's disease, skin cancer, and liver cancer. As a child, she suffered from asthma and was treated with steroids; however, the condition resolved by the time she was approximately 10 years old. She was also exposed to trichloroethylene in her drinking water and had concerns about the possibility of mold in her current home.

Socially, she had several close friends and a supportive husband. However, the client had a long history of coping with, and pushing herself through, significant life stressors. Her family history, autoimmune conditions, cancer, and psychoemotional imbalances may indicate genetic challenges with methylation and detoxification.[11] At her initial visit, she appeared to have some nutritional deficiencies (vitamin D_3, iron, fiber, essential fatty acids, and antioxidants) as indicated by her lab work and self-report. She also seemed to have difficulty making nourishing choices for herself, lacked self-compassion, and had few tools for self-care. Approximately 6 months prior to her diagnosis with Hashimoto's thyroiditis, the client began a vegan diet. She reported that this was motivated by ethical concerns around animal welfare. Once she received her diagnosis of HT, she switched to what she described as an anti-inflammatory Paleolithic diet, which she had read about as therapeutic for people with HT. During this time, she avoided all eggs, dairy, legumes, corn, refined sugars, and grains (except for sprouted quinoa and brown rice). She also put herself on a supplement regimen (Table 1).

Table 1. Client Self-care Supplements

Supplement	Dosage	Frequency
Iron	28 mg	1 ×/d
Selenium	100 mcg	1–2 ×/d
Vitamin D_3	1000 IU	1–2 ×/d
Probiotic (Garden of Life)	1 capsule	1–2 ×/d
N-acetyl-L-cysteine	500 mg	1 ×/d

Image 1. Tongue



Note: Taken by client on March 15, 2016.

Table 2. Biomarkers

Biomarker	Dec 2015	June 2016	Feb 2017
Vitamin D_3 (25-hydroxy)	24.8 ng/mL	50.9 ng/mL	-
Free T_4	1.13 ng/dL	1.15 ng/dL	1.02 ng/dL
T_4	8.1 µg/dL	8.0 µg/dL	-
TSH	4.91 µIU/mL	1.62 µIU/mL	1.66 µIU/mL
T_3 free	3.1	2.5	2.4
T_3	106 ng/dL	90 ng/dL	-
Thyroglobulin antibody	12.0 IU/mL	1.4 IU/mL	1.1 IU/mL
Thyroid peroxidase Ab	258 IU/mL	115 IU/mL	24 IU/mL

Assessment

The client was petite, ectomorphic, slightly agitated and anxious, and had a pronounced groove running down the middle of her tongue with a greyish coating (Image 1). Laboratory studies at Johns Hopkins Medical Center had led to a diagnosis of HT, iron deficiency, and vitamin D deficiency.

Therapeutic Recommendations

At her initial consult in the functional nutrition practice, on February 27, 2016, it was recommended that the client follow a less stringent diet than the one that she had put herself on in the beginning of January. The diet was a modified version of the phytonutrient rich and cardiometabolic diet from the Institute for Functional Medicine. The modifications were that she should (1) avoid gluten, raw vegetables, soy products, and foods enriched with folic acid or cyanocobalamin; (2) increase intake of omega-3 rich foods (organic flax, walnuts, wild salmon, sardines) and fermented foods (water, kefir, cultured coconut milk), and increase intake of berries and quality fats (organic: coconut oils, cold-pressed olive oil, butter or ghee); and (3) increase her water intake (6 to 8 cups/day). It was also recommended that she switch to different dietary supplements: magnesium, coenzyme B complex, vitamin D_3, probiotics, α-lipoic acid, and EPA/DHA. She was also recommended a customized herbal tincture and customized herbal tea (Table 3). The client was given a few suggestions for mindfulness practices and encouraged to exercise for at least 20 minutes, 3 to 4 times per week.

Table 3. Practitioner Recommended Supplements

Supplement	Dosage	Frequency
Magnesium	300 mg	Once daily
Coenzyme B complex	100 mg vitamin B_1, 20 mg vitamin B_2, 50 mg niacin, 20 mg vitamin B_6, 200 mcg folate, 500 mcg vitamin B_{12}, 300 mcg biotin, 50 mg pantothenic acid, 100 mg choline, 100 mg TMG, 40 mg inositol	Once daily
Vitamin D_3	2000 IU	2 tablets daily
Probiotic Flora 50-14	50 billion live organisms from 14 strains (*B lactis*, *L acidophilus*, *L casei*, *L plantarum*, *L rhamnosus*, *L salivarius*, *L brevis*, *L bulgaricus*, *L gasseri*, *L lactis*, *B longum*, *B bifidum*, *B infantis*, *S thermophilus*)	2 tablets daily
Coenzyme Q_{10}	100 mg	Once daily
α-Lipoic acid	200 mg	Once daily
DHA/EPA (omega-3)	1000 mg	2 tablets daily
Zinc citrate	30 mg	Once daily
L-Glutamine	L-Glutamine (free form) 1500 mg, pyridoxal alphaketoglutarate 500 mg, fatty acids (as vegetable stearate) 7 mg, magnesium (as vegetable stearate) 6 mg, kosher gelatin capsules 350 mg	2 tablets daily
Quercetin	Quercetin dihydrate 1000 mg	Once daily
Activated B_{12}	B_{12} (hydroxocobalamin) 2000 mcg	Once daily

Note: Client began taking magnesium and super omega-3s for 2 to 3 d and then added coenzyme B complex, Probiotic Flora, and vitamin D_3. After 2 to 3 more days, she added coenzyme Q_{10} and α-lipoic acid. Zinc citrate, L-glutamine, quercetin, and activated B_{12} were included later in her care.

Table 4. Practitioner Recommended Herbal Formulas

Herbal Formulas	
Customized Tincture	**Customized Tea**
• Ashwagandha root (*W somnifera*) • Milky oat spikelet (*A sativa*) • Damiana (*T diffusa*) • Holy basil (*O sanctum*) • Cinnamon bark (*Cinnamomum* spp)	• Chamomile flowering tops (*M chamomilla*) • Ginger (*Z officinalis*) rhizome • Agrimony (*A eupatorium*) herb

Follow-up and Outcomes

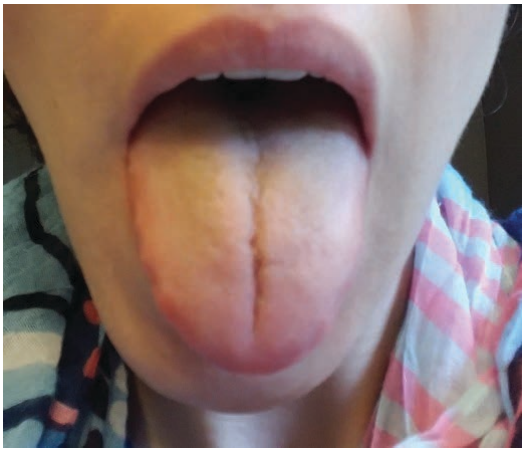
At her first follow-up on March 9, 2016, the client's dietary compliance was high. On her own, she had begun taking 2 ounces (59 mL) of apple cider vinegar 2 to 4 times per day, and exercising at least 20 minutes per day. She reported increased energy, reduced anxiety, and improved memory. During this consultation, it was suggested that she begin with the customized herbal tincture. After a communication with the practice on March 14, 2016, the tincture was temporarily stopped due to the client's reports of a headache.

At the client's second follow-up on April 6, 2016, she reported a symptom flare after returning from vacation in Jamaica where she had not followed her diet. It was recommended that she follow her initial dietary recommendations including her customized herbal tea (2 to 3 ×/day). She was recommended to increase her magnesium, probiotic, and vitamin D supplements from once to twice daily.

At her third follow-up on April 21, 2016, the client reported "feeling great." This patient was extremely compliant with her diet, nutrients, and herbs. It was suggested that she follow the Institute for Functional Medicine detoxification diet for 3 weeks, and add coenzyme Q_{10} (100 mg, OTD), and zinc citrate (30 mg, OTD).

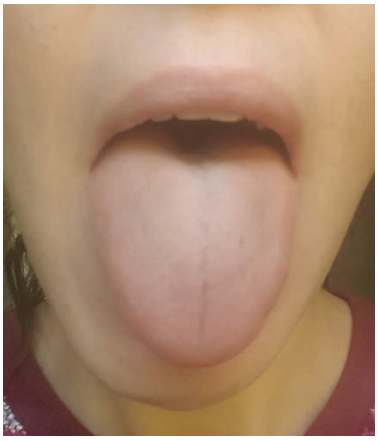
During her follow-up in early May, she reported experiencing headaches and symptoms flare-up after consuming dark chocolate and red wine that subsided after several days. She discontinued the detoxification diet and returned to her initially recommended dietary protocol. She continued to experience increased energy, decreased anxiety, and improved memory and cognitive function. It was recommended that she slowly restart the customized herbal tincture, beginning with 1.5 mL BID and discontinue the customized herbal tea blend. She was recommended to discontinue the α-lipoic acid and start on L-glutamine and quercetin (Table 4) and activated B_{12}.

Image 2. Tongue



Note: Taken by client on March 15, 2016.

Image 3. Tongue



Note: Taken by client on October 12, 2016.

At her medical check-in the beginning of June, the 6-month labs after her initial diagnosis indicated that her HT was being effectively managed with her dietary, supplement, and lifestyle modifications. In October 2016, the client reported that she had virtually no symptoms. She had continued to follow her diet and was developing her awareness of how she felt when she consumed certain foods. She was using her awareness to help her guide her dietary choices. At her next round of lab work at a conventional medical practice in February 2017, the results indicated that her thyroid peroxidase antibody levels were in the normal range and the thyroglobulin antibody levels were very slightly above normal range.

MANAGING HASHIMOTO'S THYROIDITIS THROUGH PERSONALIZED CARE

Client Perspective

"I chose to work with a functional nutrition practice, after receiving the diagnosis of Hashimoto's thyroiditis. My symptoms included fatigue, brain fog, heart racing and insomnia, despite my attempts to eliminate any possible food triggers by adhering to a very restrictive elimination diet. A complete medical history interview was administered at my first appointment. I was relieved to learn that I should add back in various foods to my diet, because I felt hungry most days. I immediately adhered to the diet and supplement suggestions, and was surprised that after just a few short weeks, my symptoms started to improve. I never used to take any supplements before, so this was a new practice for me. However, I quickly began to love my vitamins and supplements, as I noticed my energy levels increase drastically. Amazingly, after just 5 months of dietary changes, supplements, and herbal formulas, my blood test results showed that my thyroid levels were well within normal functioning limits."

DISCUSSION

HT involves the presence of thyroid antibodies along with normal thyroid function, subclinical hypothyroidism, or overt hypothyroidism.[12] The pathogenesis of HT is not fully understood, but it appears that HT develops due to a combination of an immune defect, genetic susceptibility, and environmental factors.[1] The thyroid gland gradually atrophies "following an invasion of the gland with lymphocytic cells, follicular atrophy, and hyperemia accompanied by oncocytic metaplasia of follicular cells."[1] Evidence suggests the environmental factors that can influence autoimmune thyroid disease include infections, medications, smoking (tobacco), iodine,[13] as well as selenium content in the soil. Other influences in the development of HT may include intestinal symbiotic microorganisms resulting in dysbiosis of the gut that might lead to the loss of tolerance to self-antigens, including thyroglobulin and the autoimmunity.[14] According to Fasano,[15] untreated celiac disease predisposes individuals to autoimmune disorders including HT, and it has been suggested that those with HT should be tested for celiac disease.[16] As discussed in the introduction, nutrients that have been shown to be beneficial in the clinical course of HT include zinc, copper, selenium, iron, thiamine, and vitamin B_{12}.

The medical management of HT involves thyroid hormone replacement therapy, but this does not reverse the autoimmune degradation of the thyroid gland. Individuals can still be symptomatic despite T_4 hormone replacement therapy.[3]

Functional nutrition is a systems-oriented nutritional approach to working with clients, incorporating nutritional interventions and lifestyle recommendations to support the optimal health. Symptoms related to HT are a frequent complaint of clients seen by functional nutrition practitioners. Common recommendations include stress management techniques, nutritional recommendations to decrease inflammation and restore a normal gut microbiome, decreased environmental exposures to xenobiotics, and an evidence-informed approach to dietary supplementation.

Limitations

When using multiple interventions, it is difficult to determine the role of specific interventions that may have contributed to a decrease in antithyroid antibodies and normalization of TSH and T_4 levels. Interprofessional

collaborations integrating functional nutrition with conventional medicine, acupuncture, and herbal recommendations appeared to be associated with the positive outcome for this client.

CONCLUSION

This case report of a patient with HT highlights the value of integrating a functional nutrition approach into the medical management of patients with HT. It also reveals the limitations of "one size fits all" dietary approaches and the value of personalized nutrition within a therapeutic alliance. By helping clients to develop greater awareness about how their dietary choices affect how they feel, and by providing nutritional and botanical supplements to support their unique needs, clinicians may develop a sustainable approach to managing HT long term.

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AUTHOR DISCLOSURE STATEMENT

Keren Dolan, Heather Finley, Margo Gasta, and Sasha Houseman all approved the final case report as submitted and agree to be accountable for all aspects of the work. Written informed consent was obtained from the client for publication of this case report.

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