Treating Thyroid Disease: A Natural Approach to Healing Hashimoto’s

Melissa Lea-Foster Rietz, FNP-BC, BC-ADM, RYT-200
Presbyterian Medical Services
Farmington, NM
beebopmfr@gmail.com
Professional Disclosures

I have no personal or professional affiliation with any of the resources listed in this presentation, and will receive no monetary gain or professional advancement from this lecture.
Talk Objectives

- Define hypothyroidism and Hashimoto’s.
- Discuss various tests used to identify thyroid disease and when to treat based on patient symptoms
- Discuss potential causes and identify environmental factors that contribute to disease
- Describe how the gut (food sensitivities) and the adrenals (chronic stress) are connected to Hashimoto’s and how we as practitioners can work to educate patients on prevention before the need for treatment
- How the use of adaptogens can enhance the treatment of Hashimoto’s and identify herbs that are showing promise in the research.
- How to use food, exercise, and relaxation to improve patient outcomes.
“IT IS FAR MORE IMPORTANT TO KNOW WHAT PERSON THE DISEASE HAS THAN WHAT DISEASE THE PERSON HAS.”

Hippocrates
Named for Hakuro Hashimoto, a physician working in Europe in the early 1900’s. Hashimoto’s was the first autoimmune disease to be recognized in the scientific literature.

It is estimated that one in five people suffer from an autoimmune disease and the numbers continue to rise. Women are more likely than men to develop an autoimmune disease, and it is believed that 75% of individuals with an autoimmune disease are female.

Thyroid autoimmune disease is the most common form, and affects 7-8% of the population in the United States.
Hashimoto's disease
Also called: chronic lymphocytic thyroiditis

Plasma cells produce antibodies
Antibodies attack thyroid cells
Damaged thyroid cells leak hormones
Enlarged thyroid
Thyroid Metabolism

Hypothalamus signals pituitary gland with Thyroid Releasing Hormone (TRH)

Pituitary signals thyroid gland with Thyroid Stimulating Hormone (TSH)

TSH activates Thyroid Peroxidase (TPO) to use iodine to make T4 & T3

80% T4

20% T3

Small percentage goes to reverse T3

The majority of T4 is converted to T3 in a healthy liver and the remaining is converted in kidneys, brain, and other tissues

Reverse T3 is converted to T3 in a healthy GI track

T3 is used by every cell in the body
Ms. R is a 30-year-old female, mother of three, who states that after the birth of her last child two years ago she has felt the following:

- Loss of energy
- Difficulty losing weight despite habitual eating pattern
- Hair loss
- Irregular menses
- Joints that ache throughout the day
- A general sense of sadness
• Cold Intolerance
• Joint and Muscle Pain
• Constipation
• Irregular menstruation
• Slowed Heart Rate
What tests would you run on Ms. R to further investigate?
Thyroid Testing

- **TSH:**
  - Functional Range: 1.8-3.0 mU/L
  - Typical Laboratory Range: 0.5-5.5 mU/L

- **TPO Antibodies (TPOAb):**
  - Mild to moderate elevation found in: thyroid cancer, Type 1 diabetes, rheumatoid arthritis, pernicious anemia. Associated with reproductive difficulties

- **Thyroglobulin Antibodies (TgAb):**
  - Positive in thyroid cancer and Hashimoto’s
  - Targets thyroglobulin, the storage form of thyroid hormones

- **T4:**
  - Functional Range: 6-12 ug/d
  - Typical Lab Range: 5.4-11.5 ug/d

- **Free T4:**
  - Functional Range: 1.0-1.5 ng/dL
  - Typical Laboratory Range: 0.7-1.53 ng/dL

- **Free T3:**
  - Functional Range: 300-450 pg/mL
  - Typical Lab Range: 260-480 pg/mL

- **Reverse T3:**
  - Functional Range: 90-350 pg/ml
  - Typical Lab Range: 90-350 pg/ml
Differentiating Hashimoto’s

![Image showing the regulation of TSH and T4 in normal, hyperthyroidism, hypothyroidism primary, and hypothyroidism secondary conditions.]

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>Normal</th>
<th>Hyperthyroidism</th>
<th>Hypothyroidism Primary</th>
<th>Hypothyroidism Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH</td>
<td>Normal</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>T4</td>
<td>Normal</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
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</table>
Factors that Affect Thyroid Function

Factors that contribute to proper production of thyroid hormones
- Nutrients: iron, iodine, tyrosine, zinc, selenium, vitamin E, B2, B3, B6, C, D

Factors that inhibit proper production of thyroid hormones
- Stress
- Infection, trauma, radiation, medications
- Fluoride (antagonist to iodine)
- Toxins: pesticides, mercury, cadmium, lead
- Autoimmune disease: Celiac

Factors that increase conversion of T4 to RT3
- Stress
- Trauma
- Low-calorie diet
- Inflammation (cytokines, etc.)
- Toxins
- Infections
- Liver/kidney dysfunction
- Certain medications

Factors that increase conversion of T4 to T3
- Selenium
- Zinc

RT3 and RT3 compete for binding sites

Factors that improve cellular sensitivity to thyroid hormones
- Vitamin A
- Exercise
- Zinc

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Additional Testing

- **Vitamin D level:**
  - 35 ng/mL is the minimum level

- **Ferritin Level:**
  - Male: 12-300 ng/mL
  - Female: 12-150 ng/mL

- **Vitamin B12:**
  - 200 - 900 picograms per milliliter (pg/mL)

- **Magnesium:**
  - 1.7 to 2.2 mg/dL

- **8 am Cortisol:**
  - 6 to 23 micrograms per deciliter (mcg/dL)

- **Hormone Testing:**
  - Estrogen: no “normal level as dependent on cycle, although less than 40 is considered below normal
  - Progesterone: also varies dependent on cycle and stage of life
Vitamin D

• Appears to help against autoimmune mediated thyroid dysfunction.
• Lack of vitamin D may lead to chronic nonspecific musculoskeletal pain.
• Patients with a deficiency in Vitamin D are at an increased risk for insulin resistance and metabolic syndrome.
• Vitamin D is essential for healthy bone metabolism.
Sources Vitamin D

- Solar Ultraviolet-B (UVB), sunlight!
- Minimum of 1,000 units of D3 is required to maintain concentrations of 35 or higher
- Dietary sources:
  - Fatty fish
  - Foods fortified with vitamin D (not our best option!)
Ferritin

- Primary cause for hair loss in premenopausal women
- Hypothyroidism causes a reduction in stomach acid leading to decreased iron absorption
- Integrative Medicine practitioners recommend that a ferritin level be assessed in all patients with Hashimoto’s
- Pregnancy and heavy menstruation place women at higher risk for low ferritin levels
- Intake of calcium or antacids reduces the absorption of iron from foods and supplements
Sources of Ferritin

- Present in heme and nonheme foods
- Heme: Animal products (liver, beef, turkey, and chicken)
- Nonheme: nuts, beans, spinach, not as easily absorbed
- Vitamin C increases absorption of iron
- Many individuals cannot tolerate taking oral supplements of ferrous sulfate
Vitamin B12

- Symptoms associated with vitamin B12 deficiency include: memory loss, depression, and fatigue
- Those diagnosed with Hashimoto’s have a higher incidence of developing other auto-immune disorders, like pernicious anemia
- Damage in the gut caused by ingestion of antacids and PPI’s, GERD, alcohol abuse, and weight-loss surgery can all impact absorption of B12.
Sources of Vitamin B12

- Naturally found in: animal products (fish, milk, poultry, eggs, and milk), and fortified breakfast cereals.
- PO as cyanocobalamin, 50 mcg as part of a B-Complex
- Prescription, IM injection and intranasally.
Magnesium

• Responsible for converting the inactive T4 thyroid hormone into active form of T3.
• Deficiency in magnesium is related to the formation of goiters
• Assists the body in the production of more T4
• Supplementation of calcium is widely suggested to patients, however high amounts of calcium compete with magnesium and often leads to calcium deposits in the form of renal stones and atherosclerosis.
• Deficiency can manifest as: headaches, muscle aches, fatigue, insomnia, and constipation
Sources of Magnesium

• Foods rich in magnesium: Avocado, spinach, figs, dark chocolate, chard, almonds, and pumpkin seeds.
• Hashimoto’s with constipation:
  ▫ Magnesium Citrate 400-1000 mg
• Hashimoto’s without constipation:
  ▫ Magnesium Glycinate 400-800 mg
The Adrenal Connection

- Stress causes an increase of inflammatory cytokines, leading to a down regulation of TSH, T3, and T4, stimulating an overproduction of TSH and a decrease production of the active thyroid hormone T3.
- Chronic adrenal stress weakens the hypothalamus and the pituitary leading to decrease communication with the thyroid gland
- Weakens the immune system, which leads to a weakened barrier in the digestive tract and the liver; both vital for the conversion of T4 to active T3
Cortisol

- Raises blood sugar when it drops too low, if this happens repeatedly the adrenal, thyroid, hypothalamus, and pituitary gland are all affected. This can eventually lead to functional hypothyroidism and to a weakening of the GI tract.
- Gut Inflammation: creates an alarm reaction in the body leading to increased production of cortisol which shifts higher percentages of T4 into inactive T3 (which cannot be used in the body)
- Chronic viruses: EBV (discuss later), Adrenals are called on to pump cortisol into the blood stream due to the stress caused form the viral infection, pituitary and adrenal glands are overworked=poor thyroid function
- In order to decrease cortisol levels, you must address what is causing the chronic stress overload
Adrenal Stress Index

- Saliva cortisol is usually measured 4 times during the day: upon waking up, noon, the late afternoon and before bed. Saliva is collected by spitting into a small collection tube, therefore it can be collected just about any time or any place. This is often referred to as an ASI or Adrenal Stress Index test.
Methods for Reducing Cortisol

• Avoid: concentrated sugars, nicotine, alcohol, allergenic foods, partially hydrogenated fats, artificial sweeteners
• Stabilize blood sugars
• Exercise!
• Practice relaxation techniques
• Take time off! Work-Life balance
• Supplements:
  ▫ Essential fatty acids (EPA, DHA)
  ▫ B-Complex
  ▫ Adrenal Adaptogens
Hormone Testing

- **Progesterone:**
  - Improves signaling of thyroid receptors and increase TPO activity
  - Decrease progesterone production depresses TPO and lower T4 production
  - Symptoms include: heavy periods, depression, PMS, headaches
  - Severe hypothyroidism leads to loss of ovulation due to insufficient progesterone
  - Thyroid hormones sensitize the body to progesterone

- **Estrogen:**
  - Elevated levels of estrogen decreases the conversion of T4 to active T3 in the liver

- Should include FSH and LH as these are excreted directly from the pituitary
Let’s go back to Ms. R

- How could we improve her symptoms naturally?
  - Loss of energy
  - Difficulty losing weight despite habitual eating pattern
  - Hair loss
  - Irregular menses
  - Joints that ache throughout the day
  - A general sense of sadness
What does the gut have to do with thyroid disease?

- In most causes autoimmune disorders are rooted in inflammation. This inflammation usually begins outside of, in this case, the thyroid.
- Intestinal hyperpermeability or “leaky gut” is now thought to be directly associated to the development of autoimmune disease.
- Intestinal microbiome: regulator of inflammation in the body
  - Inhibits production of TNF (tumor-necrosis factor) and NF-KB (nuclear factor-kappa B)
  - Promotes IL-10 (interleukin-10)
- Hypothyroidism impairs the function of the gallbladder
- The overuse of antibiotics and NSAIDS, overload of sugar, chronic stress, and poor diet directly impact the health of your gut, and in turn contribute to the development of thyroid disease
Gluten Intolerance

• 10% of patients with Hashimoto’s have Celiac Disease. Numerous studies have demonstrated a link between gluten intolerance and Hashimoto’s.
• Continued consumption of gluten by someone who has an intolerance causes the following: increase in immune antibodies to remove the gluten which is seen as an invader, given the close molecular structure of gluten to the thyroid gland, this leads to a production of antibodies against the thyroid gland as well.
• 20% of healthy thyroid activity depends on healthy gut bacteria
• Poor digestion depletes the body of nutrients that support thyroid health: zinc, selenium, vitamin A and D
• All patients with Hashimoto’s should be screened for gluten intolerance and Celiac Disease and vice versa.
Healing the Gut

- Remove foods creating the chronic inflammatory response, ie. the foods patients love to eat...gluten, dairy, sugar, caffeine
- Reinoculate: probiotics
- Replace: Hydrochloric acid, and digestive enzymes
- Repair: Medicinal Herbs and continued strict adherence to the anti-inflammatory diet
# Drugs that Influence Thyroid Metabolism

<table>
<thead>
<tr>
<th>Mechanism of interference</th>
<th>Drugs</th>
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<tbody>
<tr>
<td>Altering thyroid hormone serum transfer proteins</td>
<td>Increase Thyroid Binding Globulin (TBG) concentration: Estrogen, Tamoxifen, Heroin, Methadone, Clofibrate, S-Penicillamine, Miborane, Perphenazine</td>
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<tr>
<td></td>
<td>Decrease TBG concentration: Androgens, Androgenic steroids (e.g. Danazol), Glucocorticoids, Slow release nicotine acid</td>
</tr>
<tr>
<td></td>
<td>Interfere with thyroid hormone binding to TBG and / or transthyrein: Frusemide, Furosemic, Mefaracine, Mefaracine, Sorbital, Phenytoin, Dizepam, Sulphonylureas, Free fatty acids, Heparin</td>
</tr>
<tr>
<td>Agents that alter extra-thyroidal metabolism of thyroid hormone</td>
<td>Inhibit conversion of T4 to T3: PTU, Glucocorticoids, Propylthiouracil, Indolactam (Thyroid hormone converting agents), Amiodarone, Clofibrate, Phenytoin</td>
</tr>
<tr>
<td></td>
<td>Increased hepatic metabolism: Phenoethyln, Rifampin, Phenylbutazone, Carbamazepine</td>
</tr>
<tr>
<td></td>
<td>Drugs that decrease T4 absorption or enhance excretion: Cholestyramine, Colstricopit, Aluminium hydroxide, Ferrous sulphate, Sertraline, Amiodarone</td>
</tr>
</tbody>
</table>

(Adapted and reproduced from: Sunak Mj, Stewart R. Drugs and Thyroid Function. NEJM 1985; 313: 1888-89)
Love your Liver

- Metabolizes hormones
- Filters toxins
- Cleans the blood

- 60% of thyroid hormone is converted from T4 to T3 in the liver
Motivational Interviewing

What lifestyle changes could we discuss with Ms. R and how could we do this in a manner that would be well received?

What experiences have you had with patients when you bring up the need for changing habits around nutrition and exercise?
Adaptogens

- Adaptogens act to prolong the phase of resistance (theory of stress)
- Protective against stress activity
- Chronic stress increases allostatic load
- Protection of stress activity is associated with regulation of the HPA axis
- Reduce stress-induced generation of nitric oxide, decrease lactic acid, and protect the endocrine and immune systems

“Herbal preparations that increased attention and endurance in fatigue, reduced stress-induced impairment disorders related to the neuro-endocrine and immune systems”
Role in Hashimoto’s

- Improve overall quality of life
- Act as an anti-fatigue agent
- Reduce stress
- Neuro-protective
- Anti-anxiety activity
- Anti-depressive activity
- Reduce apoptosis
- Improve cognitive functioning
Herbal Support in Hashimoto’s

- **Holy Basil**
  - Acts to modulate stress levels and blood sugar levels by stabilizing cortisol and insulin
  - Powerful antioxidant

- **Ashwagandha**
  - Increases T3 and T4

- **Rhodiola**
  - Appears to raise the levels of dopamine and serotonin

- **Ginseng**
  - Helps to regulate and protect thyroid function

- **Reishi**
  - Supports normal thyroid function and stimulates the thyroid gland
Holy Basil

• In Ayurvedic Medicine Holy Basil is known as Tulsi, “incomparable one”
• Acts to modulate stress levels and blood sugar levels through the stabilization of cortisol and insulin
• Has anti-inflammatory and antioxidant properties
• Contains Vitamin C and A, powerful antioxidant

• **Dose:** 2-3 mL (40–60 drops) of tincture, in water, three times daily
• Holy Basil: An Overview of the Research and Clinical Indications
Ashwagandha

- Used to promote sleep and to encourage a healthy inflammatory response by stimulating Th-1 cell production
- Has adaptogen-like glucocorticoid activity

**Dose:** 3 to 6 grams of the dried herb in capsule form daily OR 1 to 4 mL (20-80 drops) of tincture, in water, 3 times per day

**Cautions:** Not for use in pregnancy

Ashwapghanda: An Overview of the Research and Clinical Indications

Rhodiola

• Studies suggest that Rhodiola, “inhibits the breakdown serotonin, dopamine, and norepinephrine, thus facilitating neurotransmitter transport through the brain.
• Increases chemicals that provide energy to the muscle of the heart
• Prevents depletion of catecholamines
• Prevents the production of excess cortisol

• **Dose:** 200-400 mg in capsules or tablets daily OR 2-3 mL (40-60 drops) of tincture, in water, 2-3 times daily. Use products standardized to 2-3% rosavin and 0.8-1% salidroside

• **Cautions:** Avoid if you have bipolar depression with manic behavior.
• **Rhodiola: An Overview of the Research and Clinical Indications**
Siberian Ginseng or Eleuthero

- Increases mental alertness and performance
- Enhances concentration
- Increases energy and stamina
- Reduces fatigue and stress
- Enhances immunity and improves detoxification

**Dose:** 2-3 g of dried root in capsule daily OR 2-4 mL of tincture, in water, 2-3 times daily

**Assessment report on** *Eleutheroococcus senticosus*

Reishi

- Nourish and support healthy immunity
- Increases resistance to colds and infections
- Reduces inflammation

**Dose:** 3-9 grams of the dried mushroom in capsules or tablets daily OR 2-4 mL of reishi tincture, in water 2-3 times daily

**Cautions:** Avoid with blood thinners and medications that lower blood pressure, based on theoretical risks of drug interactions.

- Guide to Reishi Mushrooms
  - [http://www.reishii.com/print/FAQ.htm](http://www.reishii.com/print/FAQ.htm)
The role of lifestyle in healing Hashimoto’s

- Relaxation Response
- Yoga (meditation, movement)
- Blood Sugar Balance
- Supplements
- Selenium & Zinc
- Out with Endocrine Disruptors
Relaxation Response

• Actively taking responsibility and control over the amount of relaxation in your life
• Savasana Challenge! Every day for 10 minutes
• Meditation, Active Stress Reduction
• Assists in healing your adrenals and restoring them to normal levels
• Practice Sleep Hygiene
Yoga

**Shoulder Stand** (Sarvangasana)
**Inverted Pose** (Viparitakarani)
**One-legged Forward Bend** (Janu Shirasasana)
**Fish Pose** (Matsyasana)
**Plow Pose** (Halasana)
**Fast-paced Sun Salutation**
(Surya Namaskar)
Blood Sugar Balance

• Development of insulin resistance with repeated insulin surges leads to increased inflammation of the thyroid gland

• Dysglycemia weakens the gut, imbalances hormone levels, and impairs overall metabolism

• Importance of gut health and food choices to include a diet composed mainly of vegetables and WHOLE foods
Supplements

- **Omega 3:**
  - EPA & DHA in essential fatty acids aid receptor sites on cells to become more sensitive to insulin
  - Doses of 1 to 4 grams are recommended, brand name Lovaza

- **Probiotics:**
  - Essential for inoculation of the gut after removal of inflammatory foods, aids in replacing pathogenic bacteria
  - Examples include lactobacillus and bifidobacterium

- **Digestive Enzymes:**
  - Aids in the breakdown of proteins thereby reducing inflammation in the gut
  - Examples: HCl, Betaine with pepsin, and pancreatin

- **Multivitamin:**
  - Recommend a high-quality whole food based vitamin
  - Ensure easy digestion given likelihood of poor gut health
Selenium & Zinc

Selenium:
- Cofactor for enzyme 5’deiodinase (responsible for converting T4 to T3 and for degrading rT3)
- Protects thyroid cells from oxidative damage from hydrogen peroxide through the formation of selenoproteins
- Recommended dose: 200 mcg taken on an empty stomach with Vitamin E

Zinc:
- May reduce thyroidal antibodies
- Low zinc plays a role in the reduction of T3
- Involved in DNA synthesis, immune function, protein synthesis, and cell division
- Dose, no more than 30 mg daily
Endocrine Disruptors

- **Dioxins:**
  - formed by-product of manufacturing and paper bleaching, main exposure is through meat, dairy, and fish

- **Phthalates:**
  - Found in the lining of food cans, dental sealants, and plastic bottles
  - Large human study links phthalates, BPA and thyroid hormone levels

- **Flame Retardants:**
  - Family of chemical compounds that reduce flammability or inhibit the spread of fire

- **Phenols:**
  - Used as a wood preservative, linked to the formation of goiter

- **Polychlorinated Biphenyls (PCB):**
  - Reduce concentrations of thyroid hormones

- **Pesticides:**
  - Exposure to pesticides occurs everyday, they alter TSH, inhibit peroxidase enzyme, and may cause thyroid nodule

- **Polyaromatic Hydrocarbons:**
  - Byproducts of combustion, exposure through burning fuels, motor vehicle exhaust

- **Phytoestrogens:**
  - Naturally occurring plant nutrient which exerts an estrogen-like effect on the body
Resources

american thyroid association: http://www.thyroid.org

Dr. Aviva Romm http://avivaromm.com

HypothyroidMom http://hypothyroidmom.com/cortisol-and-thyroid-hormones/

Dr. Datis Kharrazian https://drknews.com

Dr. Izabella Wentz http://thyroidpharmacist.com

Chris Kresser https://chriskresser.com

Andrea Nakayama http://replenishpdx.com/hashimotos/