

Nutrition: Thyroid Disorders - Part 4

Let's talk a little bit about thyroid dysfunction in the context of metabolic syndrome and/or conditions like PCOS. Studies show an increased frequency of thyroid disorders in diabetic and PCOS patients, and this is probably a bidirectional relationship, meaning thyroid disorders increase the frequency of metabolic problems, and metabolic problems increase the frequency of thyroid disorders. Metabolic syndrome is associated with inflammation, insulin resistance, and hormonal imbalances, including PCOS in women, and those hormonal disruptions can be a common underlying cause of pituitary dysfunction, poor conversion of T4 to T3, high or low thyroid-binding globulin and thyroid resistance, which are involved in all of the patterns that I mentioned earlier that don't tend to show up on conventional lab tests. Chronically high blood sugar leads to insulin resistance and inflammation; repeated insulin surges increase the destruction of thyroid gland in autoimmune thyroid disease, and generally, most people with metabolic syndrome and PCOS have a history of consuming a Standard American Diet, although of course, many are at some stage in attempting to reverse that. So these are foods, of course, if your patient is still eating those foods, they're contributing to insulin resistance and metabolic syndrome, and the very first thing you need to do is to get them on an anti-inflammatory, nutrient-dense Paleo type of diet.

For those patients, a lower-carb version of a Paleo diet may be a good place to start, but this is ... when I say "low," that's relative to the Standard American Diet, so a Standard American Diet might be as high as 40 to 45 percent of calories from carbohydrate. I'm suggesting a starting place of something like 25 percent of calories from carbohydrate. For other patients, if the insulin resistance is significant, they may need an even lower-carb approach, like 10 or 15 percent of calories from carbohydrate, at least temporarily to reach their weight-loss goals and restore insulin sensitivity. You do need to be careful, however, that the patient doesn't go too low-carb or doesn't stay on a very low-carb diet for a long period of time, because low-carb diets can actually reduce the conversion of T4 to T3, and in some cases, I've seen patients who've come to me who kind of triggered a thyroid problem just by following a very-low-carb diet for an extended period of time. So this is a little tricky to negotiate and you need to use testing and also your patient's symptoms as a guide, but you may have to experiment a bit until you find the ideal range of carbohydrate.

Other factors, of course, that influence insulin sensitivity would be exercise, so making sure they're getting aerobic and anaerobic exercise, adequate sleep, minimizing stress, and something like my 14Four program can be really helpful for people who are overweight or insulin-resistant and they're new to all of these things. It's a combination of a calorie-appropriate, lower-carb Paleo type of diet, moderate exercise, improved sleep, and stress management, and all of these will contribute significantly to improved insulin sensitivity and reduced blood glucose, and therefore improved thyroid function.

So let's review the recommendations for thyroid patients with insulin resistance, metabolic syndrome, and PCOS. A lower-carbohydrate diet, but this again is relative, I'm talking about maybe below 30 percent or below 25 percent of calories as carbohydrate, Paleo type of diet, regular to

moderate exercise, increased intake of anti-inflammatory foods and reduced intake of inflammatory foods, increasing intake of a variety of non-starchy plant foods, aiming for eight hours of sleep per night, making sure to address stress levels, and then possibly using a program like 14Four to guide a complete lifestyle overhaul in patients that are fairly new to this stuff.

I mentioned a couple of slides back that a very-low-carb diet can actually trigger thyroid problems, and the same is true for a low-calorie diet. There are plenty of studies that show that fasting and/or very-low-carbohydrate intake impair the conversion of T4 to T3. Undereating of both calories and carbohydrates can cause chronically low blood sugar and insulin levels, elevated cortisol, and dysfunctional HPA axis, especially when that's combined with overtraining, which is a combination that I'm seeing a lot more in patients these days. If you have a very-low-calorie or carbohydrate intake, insulin levels will be chronically low, which is good to some extent, but insulin is required to make that conversion of T4 to T3, and so that can be a downside of having extremely low insulin levels all the time. Inadequate food intake essentially tells the hypothalamus to reduce metabolic rate and conserve energy, and one method of conserving energy is reducing thyroid hormone activity, and that's why we often see these low TSH and T3 levels in long-term studies that look at patients who are undereating or who are starving.

Chronically low blood sugar levels lead to increased cortisol response via the adrenal glands in order to promote glucose production and change energy partitioning. Cortisol is a glucocorticoid, so its role is to increase the amount of glucose available to the brain and muscles and curb digestion, growth, and reproductive functions. Repeated cortisol release caused by episodes of low blood sugar can suppress pituitary function and reduce thyroid hormone output. High cortisol has been indicated in pituitary dysfunction, poor T4 to T3 conversion and thyroid hormone resistance. Adrenal androgen production may also affect thyroid-binding globulin output, so in other words, there are a number of mechanisms by which chronically low blood sugar and HPA axis dysfunction can cause thyroid issues and lead to also chronically high or dysfunctional blood sugar and metabolic syndrome. Hypothyroidism also has adverse effects on metabolic rate, as I mentioned before, so it can reduce glucose sensitivity, causing hypoglycemia-like symptoms, and it can cause HPA axis dysfunction, so it's a vicious cycle.

Unfortunately, this is a pretty common issue in the Paleo community now, where you see a low-carbohydrate or low-calorie diet combined with excessive glycolytic-intense activities like CrossFit or high-intensity training, and this forces the HPA axis to use stress hormones to promote glucose production by the liver to supply necessary amounts of glucose for high-intensity activity, and over time this leads to impaired HPA axis function, cortisol resistance, a condition known as adrenal PCOS, which is elevated adrenal androgens and suppressed thyroid activity. And this can be a common cause of weight or body fat gain despite a healthy diet and high levels of activity.

Patients with hypothyroid symptoms and low-normal TSH who exercise intensely should be assessed for adequate calorie and carbohydrate intake; carbohydrate intake should be matched with activity level, as we've talked about elsewhere; and calorie intake should be matched with activity level to meet energy demands and prevent ongoing catabolic state and active stress

response. You might even consider broadening the diet to include grains or legumes and dairy products if the patient tolerates them in order to provide additional dietary carbohydrate. Consider reducing training frequency or even taking a complete break from high-intensity training if symptoms are severe, and then you want to assess rest, sleep, stress management, and all of the other factors that we've been talking about.

Okay, to review the recommendations for undereating, overtraining or HPA axis dysfunction: you want to ensure adequate calorie and carbohydrate intake to match activity levels; consider broadening the diet to increase the variety of carbohydrates beyond typical Paleo carbs; consider reducing activity or taking a break from high-intensity training to allow the HPA axis to recover; assess additional recovery strategies, more rest days, more rest after training, sleep, stress management, etc.; and then you'd want to make sure you're attending to the patient's mindset, including body image dysmorphia and disordered eating tendencies that can drive inadequate food intake.

There's a strong connection, not surprisingly, between thyroid dysfunction and stress, and stress is a commonly overlooked cause of thyroid symptoms. A lot of patients will think that diet, exercise, supplements, and hormone replacement can overcome stress-induced hypothyroidism, but my experience is that stress management is a non-negotiable part of healing from thyroid conditions when stress is playing a role. Stress can induce or exacerbate autoimmune disease, insulin-resistant hormone imbalance, and also reduce total thyroid hormone output. It causes inflammation, decreases T4 to T3 conversion, weakens the immune barriers in the gut and the brain and the lungs, causes reduced sensitivity to thyroid hormone by thyroid hormone receptors, and leads to thyroid hormone resistance, and it impairs estrogen clearance and increases thyroid-binding globulin levels. So basically, stress wreaks complete havoc on the thyroid system and can cause every single one of the signs and symptoms that we've talked about so far.

Mental/Physiological Stress Sources

Work/family struggles

Chronic illness

Negative self talk

Malnutrition

Cognitive dissonance

Inadequate sleep and
disrupted circadian rhythms

Inadequate "play" or
unstructured leisure time

Inflammatory diet

Loneliness or social isolation

Shallow breathing

Traumatic events and major loss

I've listed some common sources of mental and emotional and physiological stress on this slide. We're talking about stress extensively in the HPA axis section of this course, so we'll go into a lot more detail then, but for the purposes of this presentation, just remember that stress is not always just perceived stress, which is emotional or psychological stress. Things like a chronic illness or inadequate sleep or disrupted circadian rhythms or too much exposure to artificial light at night, or not enough exposure to natural light during the day, any kind of inflammation, all of these things cause a stress response in the body.

Stress Management Practices for Improving Thyroid Health

Deep breathing or “box” breathing techniques

Meaningful volunteer work

Body scan techniques

Social interaction and play

Gratitude journaling

Physical touch with other humans or pets

Meditation and/or prayer

Laughing

Yoga and Tai Chi

Music

Moderate exercise

And here I’ve listed some stress management practices for improving thyroid health. Again, we’re covering these in great detail elsewhere, so I’m not going to go into detail here, but things like deep breathing, body scan, mindfulness-based stress reduction, yoga, tai chi, massage, acupuncture; all of these can be extremely helpful.

Okay, that’s it for now, hope you enjoyed this presentation, and I will see you soon.