FPIN's Help Desk Answers

Does a Gluten-Free Diet Reduce Symptoms of Autoimmune Thyroid Disease?

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Clinical Question

Does a gluten-free diet reduce the symptoms of autoimmune thyroid disease?

Evidence-Based Answer

There is no evidence that following a gluten-free diet reduces symptoms of autoimmune thyroid disease. However, following a gluten-free diet may decrease mean thyroid-stimulating hormone (TSH) levels. (Strength of Recommendation [SOR]: C, disease-oriented evidence in a randomized controlled trial.) In women who are euthyroid and drug-naive with chronic autoimmune thyroid disease, following a gluten-free diet decreases antithyroid peroxidase and antithyroglobulin antibodies by 24% compared with increased levels in women following a regular diet. (SOR: C, nonrandomized trial with disease-oriented outcomes.)

Evidence Summary

A 2021 randomized controlled trial (n = 92) performed at an outpatient endocrinology clinic compared the effects of a gluten-free diet with a gluten-containing diet in patients with Hashimoto thyroiditis.[1] The trial included women 18 to 55 years of age with Hashimoto thyroiditis diagnosed by the presence of antithyroid peroxidase, antithyroglobulin antibodies, and reduced echogenicity on thyroid gland ultrasonography. Exclusion criteria were having malabsorptive diseases, already following a gluten-free diet, any history of gastrointestinal tract resection, any thyroid gland removal, Graves disease, diabetes mellitus, hypertension, smoking, and the use of glucocorticoids, statins, or nonsteroidal anti-inflammatory drugs. All patients followed a regular gluten-containing diet for three months before enrolling in the study and then were assigned to follow a gluten-free diet (less than 20 mg of gluten; n = 31) or a regular diet (n = 31) consisting of at least 10 g of gluten daily. The 30 remaining patients did not complete the study due to reasons such as inability to follow the prescribed diet. Only patients who completed at least three visits were included in the analysis. All 62 participants received levothyroxine, but dosing changes were not discussed during the study. The gluten-free diet group received follow-up appointments with clinical dietitians who analyzed patients' food diaries to ensure compliance with the gluten-free diet; patients also received education on the proper distribution of macronutrients.

The primary outcomes were all disease-oriented, including levels of TSH, free triiodothyronine (FT_3), free thyroxine (FT_4), antithyroid peroxidase, and antithyroglobulin antibodies measured at baseline, three, six, and 12 months. The median TSH level at 12 months decreased in the gluten-free diet group (from 2.4 to 1.4 mIU

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per L) and in the regular diet group (from 2.3 to 1.9 mIU per L). Patients following a gluten-free diet experienced a decrease in TSH (0.33 vs. 1.17 mIU per L; $P = .039$) and an increase in FT_4 concentrations (0.01 vs. 0.1 mIU per L; $P = .022$) at 12 months compared with those following a regular gluten-containing diet. No differences were noted in the other laboratory measures. Limitations included a lack of information about levothyroxine treatment, a high dropout rate (33%) with no intention-to-treat analysis, short study duration, the inclusion of only women, and difficulties in adhering to a gluten-free diet.

A 2019 nonrandomized controlled trial (n = 34) evaluated the effects of a gluten-free diet in patients with Hashimoto thyroiditis.[2] The trial included euthyroid women 24 to 45 years of age who were not taking levothyroxine and were diagnosed with Hashimoto thyroiditis (i.e., antithyroid peroxidase antibody levels greater than 100 U per mL and thyroid hormones within normal limits [defined as TSH levels within normal limits], FT_4 between 10 and 21 pmol per L, and FT_3 between 2.6 and 6.5 pmol per L). The women also had reduced echogenicity of the thyroid parenchyma on ultrasonography and incidental findings of positive antithyroglobulin antibodies without signs of celiac disease. Patients were excluded if they were pregnant or had symptomatic celiac disease; positive antibodies against TSH receptors; or endocrine, hepatic, or renal disorders. Participants followed a gluten-free diet (n = 16) or a gluten-containing diet (n = 18; diet parameters undefined). Both groups were evaluated every two months to ensure compliance with the diet and were required to complete adherence questionnaires.

The primary outcomes of serum level TSH, FT_4, and FT_3 levels and titers of antithyroid peroxidase and antithyroglobulin antibodies were measured at baseline and six months. Patients following the gluten-free diet had a reduction in antithyroid peroxidase antibody titers of 200 U per mL, whereas patients following the gluten-containing diet increased serum titers by 29 U per mL (95% CI, 177 to 281 U per mL). Similarly, antithyroglobulin antibody titers decreased by 203 U per mL in the gluten-free diet group compared with an increase of 53 U per mL in the gluten-containing diet group (95% CI, 194 to 318 U per mL). There were no other significant differences in the other laboratory measures. Limitations included the nonrandomized nature, the number of participants, and a limited six-month duration.

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