Celiac Disease and Autoimmune Hypothyroidism: An Interplay of Conditions

Iman Waheed Khan, MD; Tirumala Nischal Jasty, MD; Sara Khan, MD; Muhammad Umer Riaz Gondal, MD; Christopher Reggio, DO; Hira Hanif, MD; Anthony Donato, MD.
Reading Hospital, Tower Health

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INTRODUCTION

Autoimmune hypothyroidism results in destruction of thyroid gland which requires treatment with levothyroxine to help achieve euthyroid state. Other autoimmune conditions can concurrently occur, and these can not only mask symptoms of hypothyroidism but also decrease effectiveness of levothyroxine. One such example is celiac disease, found in 2-5% cases of autoimmune hypothyroidism. This affects the small intestine mucosa leading to malabsorption of levothyroxine and causing worsening of hypothyroidism.

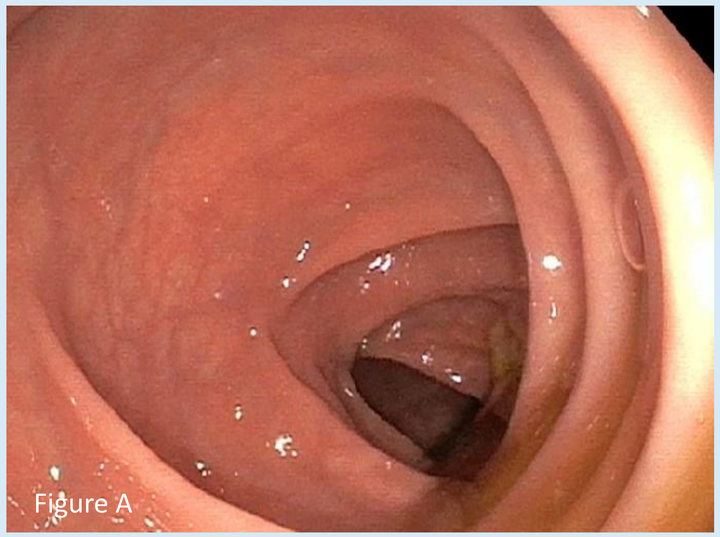
Figure A

Figure A: Colonoscopy and endoscopy (picture of colon)

- **Duodenum and terminal ileum biopsy** revealed small intestinal mucosa with attenuated villous morphology and increased intraepithelial lymphocytes, consistent with celiac disease.
- **Colon biopsy** revealed lymphocytic colitis.

CASE DESCRIPTION

A 19-year-old female with history of autoimmune alopecia, autoimmune hypothyroidism, lymphocytic colitis with 6 watery stools per day at baseline and recently diagnosed celiac disease via duodenal biopsy, reportedly compliant with gluten-free-diet (**GFD**) presented to the emergency department with 10 days of worsening diarrhea, vomiting, dehydration and generalized abdominal pain. She had a gradual weight loss over months, hair loss and loss of eyebrows which she attributed to her autoimmune alopecia.

- Her physical examination revealed abdominal tenderness and she had a normal thyroid exam. Initial lab work revealed potassium 3.3 mmol/L, negative gastrointestinal pathogen panel and fecal calprotectin elevated to 1520 mcg/g. Celiac antibody panel was negative as before.
- Gastroenterology was consulted and patient was started on prednisone 20 mg and loperamide 4 mg twice daily for lymphocytic colitis which gradually improved her diarrhea and abdominal tenderness.
- She was incidentally noted to have increased cold intolerance for which thyroid function tests (TFTs) were ordered. Her thyroid stimulating hormone (TSH) was >488 uIU/mL and free T4 <0.25 ng/dl. She was on oral levothyroxine for hypothyroidism which she was compliant with, missing only a few days due to her nausea and vomiting, hence it did not explain her very abnormal TFTs.
- Endocrinology was consulted at this point and patient was initially started on intravenous levothyroxine. She was then discharged on increased dosage of oral liquid levothyroxine with plans to follow up outpatient with repeat TFTs in 4-6 weeks.

DISCUSSION

Hypothyroidism can present as constipation, hair loss, cold intolerance, weight gain, muscle weakness. In this case, the patient presented with diarrhea, weight loss and autoimmune alopecia. This is a good example of the need for close surveillance in patients with multiple autoimmune conditions that can have conflicting symptoms.

- Interestingly, there is some evidence that increased fecal calprotectin can be an indication for celiac disease in patients non-compliant with GFD [1]. Hence, it can be an important marker for seronegative untreated celiac disease.
- The absorption of levothyroxine can be affected in celiac disease, often requiring higher doses of levothyroxine or alternative formulation [2]. There are liquid dosage formulations that offer higher bioavailability which may be helpful for such cases [3].
- Some reports have shown decreased requirement of levothyroxine with GFD versus without GFD [42]. However, it is important to note that GFD for a few months can help decrease clinical symptoms from celiac disease but this does not guarantee mucosal recovery in small intestine [53].

More studies need to be done to assess absorption of different formulations of levothyroxine in GFD-compliant Celiac disease patients.