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Gastrointestinal Manifestations in Turner Syndrome: Celiac Disease

Invited Lecturer:

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BRIEF LECTURE NOTES

- **Turner Syndrome (TS) is characterized as a sex-chromosomal condition[1, 2]**
  - Defined as a normal X chromosome + absent or structurally-altered second sex chromosome
  - Prevalence: 50 per 100,000 live female births

- **Several organ system disorders have been associated with Turner Syndrome**
  - Cardiac, endocrine, metabolic, bone health, etc.
  - Documented evidence of an increased prevalence of certain autoimmune conditions within the TS population

- **TS-associated Autoimmune Disorders with gastrointestinal (GI) impacts[1, 3]**

Disorders with GI Impact	COMMON SYMPTOMS
Inflammatory Bowel Disease (Crohn's Disease, Ulcerative Colitis)	Diarrhea, blood in stools, weight loss, abdominal discomfort, anemia
Celiac Disease (seen in 3% of TS patients)	Diarrhea, weight loss, abdominal discomfort, anemia, bloating
Hashimoto's Thyroiditis	Constipation, bloating, decreased appetite/energy, weight gain, swelling
Type 1 Diabetes Mellitus	Constipation/diarrhea, early satiation, bloating

- **While autoimmune conditions are important to watch for in the setting of TS, most of the common GI conditions seen are the same as those described in the general population**
  - "Heartburn", other abdominal pains
  - Diarrhea, constipation
  - Bloating, flatulence
  - Obesity, weight loss/gains
  - Dietary intolerances

- ***Discuss these symptoms with your Primary Care Provider if these are persistent/worsening for you, and consider Gastroenterology referral if needed!***

- **What is Celiac Disease (CD)?[4, 5]**
  - CD is an autoimmune condition, a condition where the immune system confuses ***self*** for ***enemy***
  - Unique among autoimmune conditions given its clearly-identified environmental trigger mechanism: ***gluten***
  - **Classic CD** is characterized by a constellation of GI-related symptoms
    - Malabsorption (diarrhea, weight loss, nutritional deficiencies)
    - Abdominal discomfort, bloating/flatulence
    - Extra-intestinal features (i.e. Dermatitis Herpetiformis, rare)
  - **Atypical CD** manifestations are varied, should be discussed with your PCP if suspicion for such

- ***Gluten*, a <u>normal exposure</u> in dietary intake, is confused for an *antigen* (marker of illness)**
  - Occurs only in genetically-susceptible individuals
  - Immune system recognizes that *gluten* looks similar to normal intestinal structural proteins

- **Immune system confuses normal intestinal cells for *antigen* as well**
  - Ramps up direct cell injury and antibody production pathways to *"eradicate the illness"*
  - *Self* induced to attack *self* = autoimmune condition

- **What is gluten?**
  - Storage protein present in **wheat, rye, and barley**

- **Who is susceptible to developing CD?**
  - CD **requires** the presence of at least one of two key *HLA haplotypes (genetics)*
  - Most common HLA-DQ2 (either one or both alleles):
    - Found in 95% of CD cases
    - Less common HLA-DQ8 (both or with HLA-DQ2)
  - CD is an autoimmune condition that is seen on EVERY continent (except Antarctica), but is present at varying rates in different populations.

- **How can one be tested to see if they have CD?[2, 4-6]**
  - Usually done in patients who are reporting typical symptoms (as discussed above, though some patients may present with alternate manifestations instead)
  - Initial evaluation is usually done with a few specific blood tests for celiac disease, along with some blood tests to assess for anemia (low blood count) related to iron deficiency
  - Usually an Upper GI Endoscopy (scope-camera test under sedation) with a Gastroenterologist is recommended to confirm the presence of CD by a biopsy of the small intestine
  - *May have a higher prevalence in patients with Turner Syndrome, possible role for celiac disease screening (particularly to capture atypical early presentations) but screening intervals are unclear*

- **What is the treatment for CD?**
  - Strict avoidance of gluten-containing foods in the diet resolves the symptoms for >95% of patients with CD.
  - Best sustainable success is typically obtained by working in partnership with your Primary Care Provider, Gastroenterologist, and a Registered Dietician!
    - Provides best support for making the necessary dietary & lifestyle changes, as well as helping you discern issues with cross-contamination or partial response

- **Take Home Points**
  - Turner Syndrome (TS) does carry risk for development of autoimmune disorders in some individuals
    - Several conditions with impacts on gastrointestinal (GI) health have been described
  - There may be a role for proactive screening for celiac disease, particularly in symptomatic TS patients
  - Have an open conversation with your PCP
    - Consider Gastroenterology referral if persistent/recurrent GI symptoms are present

KEY REFERENCES FOR THIS LECTURE (Information accurate as of date of lecture):

1. Bakalov, V.K., et al., *Autoimmune disorders in women with turner syndrome and women with karyotypically normal primary ovarian insufficiency.* J Autoimmun, 2012. **38**(4): p. 315-21.
2. Bondy, C.A. and G. Turner Syndrome Study, *Care of girls and women with Turner syndrome: a guideline of the Turner Syndrome Study Group.* J Clin Endocrinol Metab, 2007. **92**(1): p. 10-25.
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4. Fasano, A. and C. Catassi, *Clinical practice. Celiac disease.* N Engl J Med, 2012. **367**(25): p. 2419-26.
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CONTACT INFORMATION, OR FOR FURTHER QUESTIONS:

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