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]

<table>
<thead>
<tr>
<th>Disorders with GI Impact</th>
<th>COMMON SYMPTOMS</th>
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<tbody>
<tr>
<td>Inflammatory Bowel Disease (Crohn’s Disease, Ulcerative Colitis)</td>
<td>Diarrhea, blood in stools, weight loss, abdominal discomfort, anemia</td>
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<tr>
<td>Celiac Disease (seen in 3% of TS patients)</td>
<td>Diarrhea, weight loss, abdominal discomfort, anemia, bloating</td>
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<tr>
<td>Hashimoto’s Thyroiditis</td>
<td>Constipation, bloating, decreased appetite/energy, weight gain, swelling</td>
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<tr>
<td>Type 1 Diabetes Mellitus</td>
<td>Constipation/diarrhea, early satiation, bloating</td>
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• 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 normal exposure 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):


CONTACT INFORMATION, OR FOR FURTHER QUESTIONS:

M HEALTH Gastroenterology & Inflammatory Bowel Disease Clinic
http://www.mhealth.org/care/specialties/gastroenterology-adult