

HOSPITAL PHYSICIAN®

PEDIATRIC GASTROENTEROLOGY BOARD REVIEW MANUAL

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The *Hospital Physician Pediatric Gastroenterology Board Review Manual* is a study guide for fellows and practicing physicians preparing for board examinations in pediatric gastroenterology. Each manual reviews a topic essential to the current practice of pediatric gastroenterology.

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Celiac Disease

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Celiac Disease

Muralidhar Jatla, MD, and Ritu Verma, MD

INTRODUCTION

Celiac disease is an immune-mediated enteropathy caused by inflammation induced by a permanent sensitivity to gluten, a protein found in wheat, barley, rye, and other grains, in genetically susceptible individuals. It presents in symptomatic patients with gastrointestinal and nongastrointestinal symptoms, in patients without specific celiac disease symptoms who are affected by type 1 diabetes, Down syndrome, Turner's syndrome, Williams syndrome, and selective IgA deficiency, and in first-degree relatives of individuals with celiac disease.¹ Although the classic patient with malnutrition and a distended abdomen is readily diagnosed, it is becoming increasingly evident that symptomatic celiac disease patients represent just the tip of the celiac iceberg (Figure). Affecting 1% of the general population in the United States, including children, untreated celiac disease poses long-term adverse health consequences, including osteoporosis, anemia, poor growth, increased risk for autoimmune conditions, and intestinal lymphoma.² This review describes the epidemiology, pathophysiology, associated conditions, and treatment of celiac disease, with an emphasis on aspects specific to the pediatric population.

EPIDEMIOLOGY

Once thought to be a rare childhood disorder, celiac disease is now recognized as a prevalent disease, with approximately 1 case per 100 persons.³ The prevalence of celiac disease in children between ages 2.5 and 15 years of age is 3 to 13 per 1000 children (0.3%–1.25%). A substantial number of celiac disease cases go undiagnosed, and the number of missed cases may be 10 to 50 times greater than the number of diagnosed cases.⁴ In silent celiac disease, patients have no or minimal symptoms but demonstrate mucosal damage on biopsy and have positive serologic testing (Figure). These patients represent the middle of the celiac iceberg and are identified by screening asymptomatic individuals from at-risk groups (eg, first-degree relatives of celiac disease pa-

tient, patients with Down syndrome or type 1 diabetes).⁵ The base of the iceberg is comprised of patients with latent celiac disease. These asymptomatic patients may show positive serology and have the human leukocyte antigen (HLA)-DQ2 and/or HLA-DQ8 haplotype but have normal mucosa on biopsy. They also are typically identified by screening at-risk groups. Under certain circumstances (eg, stress, infection), these individuals will develop mucosal changes and/or symptoms at some point.⁶

HIGHER PREVALENCE GROUPS

A higher prevalence of celiac disease is seen in patients with certain genetic and autoimmune conditions and in relatives of those with celiac disease (Table 1).⁷ The frequency of celiac disease in first-degree relatives of patients with diabetes or celiac disease is 5%,⁸ and it is 5% in type 1 diabetes, 4% to 8% in autoimmune thyroiditis, 7% in IgA deficiency, 4% to 19% in Down syndrome,⁹ 8% in Williams syndrome, and 4% to 10% in Turner's syndrome. These groups have a celiac disease incidence rate roughly 5 times greater than that of the general population. Screening with serologic tests (tissue transglutaminase [tTG] antibody and endomysial antibody [EMA]) is recommended in these groups beginning at age 3 years; if the results are negative, serologic testing is recommended when symptoms occur.¹⁰ Other conditions associated with a higher prevalence of celiac disease in adult studies include arthritis (1.5%–7.5%), autoimmune liver diseases (6%–8%), Sjögren's syndrome (2%–15%), idiopathic dilated cardiomyopathy (5%), and IgA nephropathy (4%).¹¹

Autoimmune disorders and celiac disease frequently coexist, and the 2 disorders are believed to have a common genetic and immunologic mechanism. The prevalence of autoimmune disorders in celiac disease is related to duration of gluten exposure.¹² A multicenter national study showed that if celiac disease is diagnosed before age 2 years, the risk for developing an autoimmune disorder by early adulthood is 5%.¹² The risk increases to 17% if celiac disease is diagnosed between ages 2 and 10 years and to 24% with diagnosis after age 10 years. The prevalence of autoimmune disorders in diabetic patients with celiac disease was significantly higher than