MAYO CLINIC

REVIEW

Crohn Disease: Epidemiology, Diagnosis, and Management

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Abstract

Crohn disease is a chronic idiopathic inflammatory bowel disease condition characterized by skip lesions and transmural inflammation that can affect the entire gastrointestinal tract from the mouth to the anus. For this review article, we performed a review of articles in PubMed through February 1, 2017, by using the following Medical Subject Heading terms: *crohns disease*, *crohn's disease*, *crohn disease*, *inflammatory bowel disease*, and *inflammatory bowel diseases*. Presenting symptoms are often variable and may include diarrhea, abdominal pain, weight loss, nausea, vomiting, and in certain cases fevers or chills. There are 3 main disease phenotypes: inflammatory, structuring, and penetrating. In addition to the underlying disease phenotype, up to a third of patients will develop perianal involvement of their disease. In addition, in some cases, extraintestinal manifestations may develop. The diagnosis is typically made with endoscopic and/or radiologic findings. Disease management is usually with pharmacologic therapy, which is determined on the basis of disease severity and underlying disease phenotype. Although the goal of management is to control the inflammation and induce a clinical remission with pharmacologic therapy, most patients will eventually require surgery for their disease. Unfortunately, surgery is not curative and patients still require ongoing therapy even after surgery for disease recurrence. Importantly, given the risks of complications from both Crohn disease and the medications used to treat the disease process, primary care physicians play an important role in optimizing the preventative care management to reduce the risk of complications.

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Crohn disease (CD) was first described by Dr Burrill B. Crohn and colleagues in 1932.[1] Along with ulcerative colitis (UC), it falls under the spectrum of chronic idiopathic inflammatory bowel disease (IBD).[2] A recent estimate suggests that 1.3% (3 million individuals) of the US population has a diagnosis of IBD.[3] Crohn disease is a chronic disease with an annual incidence ranging from 3 to 20 cases per 100,000.[4] The median onset of disease is age 30 years and it has 2 peaks, first between age 20 and 30 years and then a smaller peak around age 50 years. Crohn disease is characterized by discontinuous skip lesions affecting any part of the gastrointestinal tract from the mouth to the anus. The inflammation is classically transmural and on pathology granulomas may be present on biopsies.[5] Presenting symptoms are variable but can include diarrhea, abdominal pain, weight loss, nausea, vomiting, and sometimes fevers or chills.[6] The natural history of the disease is one of periods of remission and flares. There are multiple different phenotypes of disease including inflammatory, stricturing, and penetrating. Patients can have 1 or more of these disease phenotypes during the course of their disease, and patients often progress from inflammatory to stricturing or penetrating. Unfortunately, there is no cure for CD and most patients require at least 1 surgical resection.[5] The goal of medical therapy is to achieve a steroid-free clinical and endoscopic remission with the hopes of preventing complications and surgery. Until recently, medication options were limited to thiopurines, methotrexate (MTX), natalizumab, and anti−tumor necrosis factor (anti-TNF) agents. Of late, drugs with novel mechanisms of action have been approved including a gut-selective antiintegrin (α4b7) inhibitor and a monoclonal antibody to IL-12/IL-23. For this review article, we performed a review of articles in PubMed through February 1, 2017, by using the following Medical Subject Heading terms: crohns disease,

ARTICLE HIGHLIGHTS

- Crohn disease is a chronic condition characterized by skip lesions affecting any part of the gastrointestinal tract from the mouth to the anus.
- Presenting symptoms are variable but include diarrhea, abdominal pain, weight loss, nausea, vomiting, and sometimes fevers or chills.
- Diagnosis is made in the right clinical setting via endoscopic and/or radiologic findings.
- Treatment is based on severity of symptoms and underlying disease phenotype. The most effective therapies are the biologic therapies (anti–tumor necrosis factor, anti-integrin, and IL-12/IL-23 inhibitors).
- Primary care physicians are critical in optimizing the overall care of these patients and limiting potential complications.

crohn's disease, crohn disease, inflammatory bowel disease, and inflammatory bowel diseases.

EPIDEMIOLOGY

The prevalence of CD has an incidence of 3 to 20 cases per 100,000.[4] Crohn disease is more common in the industrialized world, particularly in North America and Western Europe, though the incidence is rising in Asia and South America.[7,8] There may be a slightly higher predominance of CD in women and it is more common in individuals of Ashkenazi Jewish origin than in non-Jews. The exact pathogenesis of CD is unknown, although there are a number of genetic and environmental factors that have been shown to increase the risk of the disease and lead to the aberrant gut immune response characteristic of the disease.[7]

RISK FACTORS

Risk factors for the development of CD appear to be related to changes in the gut microbiome or disruptions to the intestinal mucosa and genetics.

Environmental Risk Factors

Crohn disease appears to be triggered by alterations in the gut microbiome or disruption in the intestinal mucosa.[8] Patients with IBD often have a dysbiosis that results in a reduction in the diversity of the gut microbiome.[9] Although the literature surrounding the specifics is evolving, the exact mechanism by which alterations in the gut microbiome predispose to CD is still not fully understood.

Gastrointestinal infections, nonsteroidal anti-inflammatory drugs, and antibiotics have all been implicated in the development of IBD.[7,8,10-12] However, none of these associations has been substantiated with large epidemiological studies. In one study, patients with enteric infections from salmonella or campylobacter had an increased risk of developing IBD within the first year of their illness.[10] Also, sustained use of nonsteroidal anti-inflammatory drugs, especially in women, may increase the risk of IBD.[11] Antibiotic exposure early in life has also been associated with an increased risk of developing CD.[13] In women, both hormone replacement therapy and oral contraceptives may increase the risk of IBD.[12,14,15]

The best-studied environmental risk factor, cigarette smoking, doubles the risk of developing CD.[16] This risk is increased in both current and former smokers.[17] Studies have also suggested that appendectomy may increase the risk of CD but this may be due to inaccurate classification of appendicitis which in truth was actually CD.[18] The role of diet in the development of CD also remains unclear. Some studies have suggested that diets high in sugar, omega-6 fatty acids, polyunsaturated fatty acids, total fat, oil, and meat increase the risk of CD whereas a diet high in fiber and fruit decreased the risk of CD.[19-21] However, further studies are still needed to clarify the role of diet and the risk of developing CD.

Genetic Risk Factors

Although family history does portend an increased risk, only 10% to 25% of patients with IBD have a first-degree relative with the disease.[7] In twin studies, concordance rates for CD in monozygotic twins range from 20% to 50% compared with 10% in dizygotic twins.[22-25] Crohn disease is more common in patients of Ashkenazi Jewish origin than in non-Jews and is less frequently seen in African Americans or Hispanics.[7] Although genetic risk factors are still being elucidated, there are more than 200 genes that have been

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