Crohn disease

Crohn disease is a complex, long-lasting (chronic) disorder that primarily affects the digestive system. This condition involves an abnormal immune response that causes excess inflammation. It most often affects the intestinal walls, particularly in the lower part of the small intestine (the ileum) and portions of the large intestine (the colon). However, inflammation can occur in any part of the digestive system, from the mouth to the anus. The inflamed tissues become thick and swollen, and the inner surfaces of the digestive system may develop open sores (ulcers).

Crohn disease most commonly appears in a person’s late teens or twenties, although the disease can begin at any age. Signs and symptoms tend to flare up multiple times throughout life. The most common features of this condition are persistent diarrhea, abdominal pain and cramping, loss of appetite, weight loss, and fever. Some people with Crohn disease have blood in the stool from inflamed tissues in the intestine; over time, chronic bleeding can lead to a low number of red blood cells (anemia). In some cases, Crohn disease can also cause inflammation affecting the joints, eyes, or skin.

Intestinal blockage is a common complication of Crohn disease. Blockages are caused by swelling or a buildup of scar tissue in the intestinal walls. Some affected individuals also develop fistulae, which are abnormal connections between the intestine and other tissues. Fistulae occur when ulcers break through the intestinal wall and passages form between loops of the intestine or between the intestine and nearby structures (such as the bladder, vagina, or skin).

Crohn disease is one common form of inflammatory bowel disease (IBD). Another type of IBD, ulcerative colitis, also causes chronic inflammation of the intestinal lining. Unlike Crohn disease, which can affect any part of the digestive system, ulcerative colitis typically causes inflammation only in the colon.

Frequency

Crohn disease is most common in western Europe and North America, where it has a prevalence of 100 to 300 per 100,000 people. More than half a million Americans are currently affected by this disorder. Crohn disease occurs more often in people of northern European ancestry and those of eastern and central European (Ashkenazi) Jewish descent than among people of other ethnic backgrounds. For reasons that are not clear, the prevalence of Crohn disease has been increasing in the United States and some other parts of the world.

Causes

The causes of Crohn disease are complex. This condition results from a combination of genetic, environmental, and lifestyle factors, many of which are unknown.
Many of the major genes related to Crohn disease, including NOD2, ATG16L1, IL23R, and IRGM, are involved in immune system function. The proteins produced from these genes help the immune system sense and respond appropriately to bacteria in the lining of the digestive tract. Many of the proteins play roles in autophagy, which is a process that cells use to surround and destroy bacteria and viruses. Variations in these genes may disrupt autophagy or otherwise alter the immune system's response to bacteria in the digestive system. In combination with other genetic and environmental factors, these changes can lead to chronic inflammation and result in the digestive problems characteristic of Crohn disease.

Researchers have identified at least 200 genetic variations that influence Crohn disease risk. The majority of these variations are thought to act by subtly changing the amount, timing, and location of gene activity (expression). The mechanism by which many of the variations influence disease risk is unknown, although they probably alter immune system function in some way. Considered together, the known genetic variations account for only a small percentage of the total Crohn disease risk that is due to genetic factors.

Environmental and lifestyle factors likely have a large impact on Crohn disease risk. Studies have found that cigarette smoking doubles the likelihood of developing this disease, and it may also play a role in periodic flare-ups of signs and symptoms. Crohn disease is more prevalent in urbanized societies, suggesting that factors related to increased industrialization and sanitation also play a role. Additionally, certain aspects of a person's diet, including sugar, fats, and fiber, have been proposed to influence Crohn disease risk. Many of the potential lifestyle and environmental risk factors are probably related, directly or indirectly, to abnormal inflammation. However, the exact relationship between these factors and Crohn disease risk remains unclear.

**Inheritance Pattern**

The inheritance pattern of Crohn disease is unclear because many genetic and environmental factors are likely to be involved. However, Crohn disease tends to cluster in families; about 15 percent of affected people have a first-degree relative (such as a parent or sibling) with the disorder.

**Other Names for This Condition**

- colitis, granulomatous
- Crohn’s disease
- Crohn's enteritis
- enteritis, granulomatous
- enteritis, regional
Diagnosis & Management

Formal Treatment/Management Guidelines


Genetic Testing Information

• What is genetic testing? /primer/testing/genetictesting

• Genetic Testing Registry: Crohn disease

• Genetic Testing Registry: Inflammatory bowel disease 1

Research Studies from ClinicalTrials.gov

• ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22Crohn+disease%22

Other Diagnosis and Management Resources

• Crohn's & Colitis Foundation: Crohn's Diagnosis & Testing
  http://www.crohnscolitisfoundation.org/what-are-crohns-and-colitis/what-is-crohns-disease/crohns-diagnosis-testing.html

• Crohn's & Colitis Foundation: Crohn's Treatment Options

• Crohn's & Colitis Foundation: Find a Healthcare Professional
  http://www.crohnscolitisfoundation.org/living-with-crohns-colitis/find-a-doctor/

• MedlinePlus Encyclopedia: Crohn's disease
  https://medlineplus.gov/ency/article/000249.htm
• National Institute of Diabetes and Digestive and Kidney Diseases: Diagnosis of Crohn's Disease
https://www.niddk.nih.gov/health-information/digestive-diseases/crohns-disease/diagnosis

• National Institute of Diabetes and Digestive and Kidney Diseases: Treatment for Crohn's Disease
https://www.niddk.nih.gov/health-information/digestive-diseases/crohns-disease/treatment

Additional Information & Resources

Health Information from MedlinePlus

• Encyclopedia: Crohn's disease
https://medlineplus.gov/ency/article/000249.htm

• Health Topic: Crohn's Disease
https://medlineplus.gov/crohnsdisease.html

Genetic and Rare Diseases Information Center

• Crohn’s disease
https://rarediseases.info.nih.gov/diseases/10232/crohns-disease

• Crohn's disease of the esophagus

• Pediatric Crohn's disease
https://rarediseases.info.nih.gov/diseases/9856/pediatric-crohns-disease

Additional NIH Resources

• National Institute of Diabetes and Digestive and Kidney Diseases
https://www.niddk.nih.gov/health-information/digestive-diseases/crohns-disease

Educational Resources

• Boston Children's Hospital
http://www.childrenshospital.org/conditions-and-treatments/conditions/c/crohns-disease

• International Inflammatory Bowel Disease Genetics Consortium (IIBDGC)
https://www.ibdgenetics.org/about.html

• KidsHealth from the Nemours Foundation

• MalaCards: crohn’s disease
https://www.malacards.org/card/crohns_disease
• Merck Manual Consumer Version

• Orphanet: NON RARE IN EUROPE: Crohn disease
  https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=206

Patient Support and Advocacy Resources
• American Autoimmune Related Diseases Association
  https://www.aarda.org/
• Crohn's & Colitis Foundation
  http://www.crohnscolitisfoundation.org/
• Resource list from the University of Kansas Medical Center
  http://www.kumc.edu/gec/support/gastroen.html

Scientific Articles on PubMed
• PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Crohn+Disease%5BMAJR%5D%29+AND+%28Crohn+disease%5BTI%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+720+days%22%5Bdp%5D

Catalog of Genes and Diseases from OMIM
• INFLAMMATORY BOWEL DISEASE (CROHN DISEASE) 1
  http://omim.org/entry/266600
• INFLAMMATORY BOWEL DISEASE (CROHN DISEASE) 10
  http://omim.org/entry/611081
• INFLAMMATORY BOWEL DISEASE (CROHN DISEASE) 19
  http://omim.org/entry/612278
• INFLAMMATORY BOWEL DISEASE 2
  http://omim.org/entry/601458
• INFLAMMATORY BOWEL DISEASE 3
  http://omim.org/entry/604519
• INFLAMMATORY BOWEL DISEASE 4
  http://omim.org/entry/606675
• INFLAMMATORY BOWEL DISEASE 5
  http://omim.org/entry/606348
• INFLAMMATORY BOWEL DISEASE 6
  http://omim.org/entry/606674
• INFLAMMATORY BOWEL DISEASE 7
  http://omim.org/entry/605225
• INFLAMMATORY BOWEL DISEASE 8
  http://omim.org/entry/606668
• INFLAMMATORY BOWEL DISEASE 9
  http://omim.org/entry/608448
• INFLAMMATORY BOWEL DISEASE 11
  http://omim.org/entry/191390
• INFLAMMATORY BOWEL DISEASE 12
  http://omim.org/entry/612241
• INFLAMMATORY BOWEL DISEASE 13
  http://omim.org/entry/612244
• INFLAMMATORY BOWEL DISEASE 14
  http://omim.org/entry/612245
• INFLAMMATORY BOWEL DISEASE 15
  http://omim.org/entry/612255
• INFLAMMATORY BOWEL DISEASE 16
  http://omim.org/entry/612259
• INFLAMMATORY BOWEL DISEASE 17
  http://omim.org/entry/612261
• INFLAMMATORY BOWEL DISEASE 18
  http://omim.org/entry/612262
• INFLAMMATORY BOWEL DISEASE 20
  http://omim.org/entry/612288
• INFLAMMATORY BOWEL DISEASE 21
  http://omim.org/entry/612354
• INFLAMMATORY BOWEL DISEASE 22
  http://omim.org/entry/612380
• INFLAMMATORY BOWEL DISEASE 23
  http://omim.org/entry/612381
• INFLAMMATORY BOWEL DISEASE 24
  http://omim.org/entry/612566
• INFLAMMATORY BOWEL DISEASE 25, AUTOSOMAL RECESSIVE
  http://omim.org/entry/612567
• INFLAMMATORY BOWEL DISEASE 27
  http://omim.org/entry/612796
• INFLAMMATORY BOWEL DISEASE 28, AUTOSOMAL RECESSIVE
  http://omim.org/entry/613148
Medical Genetics Database from MedGen

- Crohn disease

Sources for This Summary

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/26097717 
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4447044/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/25523552

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/28601423

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/23128233 
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3491803/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/24913378 
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4075408/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17554261 
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2628541/
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17435756
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2757939/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/27914655

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/28838408

Reprinted from Genetics Home Reference:

Reviewed: December 2017
Published: November 13, 2018

Lister Hill National Center for Biomedical Communications
U.S. National Library of Medicine
National Institutes of Health
Department of Health & Human Services