

## Brief Review on Ulcerative Colitis and Associated Disorders

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### Abstract

Gastrointestinal (GI) tract also known as alimentary canal started from mouth till to the anus which is responsible for transportation, digestion of the food, and absorption procedure. Various micro-organisms are present in the digestive tract which is responsible for these processes but imbalance in gut microbiota can lead to various digestive disorders for example constipation, diarrhea, skin irritations, autoimmune conditions, food intolerance etc. It is believed that unhealthy gut microbiome may lead to Inflammatory Bowel Disease (IBD) which is an Autoimmune Disorder. IBD is the inflammatory condition of colon and intestine. Ulcerative colitis and Crohn's disease are the type of inflammatory bowel disease. Ulcerative colitis specifically affects the colon and rectum whereas Crohn's disease affects small intestine as well as large intestine. In this review, recently associated disorders linked with ulcerative colitis have been discussed in brief along with the comparison of UC and Crohn's disease. It is very important to understand the differences between both of them as symptoms are most likely the same.

**Keywords:** Ulcerative colitis; Gastrointestinal tract; Inflammation; Diarrhea; Ulcers

there is lack of research which can clearly shows the relation between both.

### Introduction

Ulcerative colitis (UC) is the disorder of colon and rectum forming long-lasting inflammation and ulcers in digestive tract [1]. Inflammatory bowel disease is the broad term under which ulcerative colitis and Crohn's disease included. UC majorly affects the innermost lining of the large intestine of the rectum which causes irritation and swelling called inflammation that ultimately leads to lesions called ulcers in the lining. Symptoms for ulcerative colitis can sporadically vary from no symptoms to flares which include abdominal pain and diarrhea with blood along with fever, weight loss initially and later can lead to more complicated disease such as colon cancer, megacolon, inflammation of eye, liver [2,3]. Ulcerative colitis can be devitalizing disease which can lead to life-threatening complications. Cause for UC is still unknown, but physician mostly rely on clinical features and endoscopic finding of colon, biopsy along with laboratory biomarkers. This technique requires trained endoscopist as it can be time consuming, painful but let the patient knows about the severity and extent of the respective diseases. Treatment can immensely reduce signs and symptoms and even make life easy to bring about durable absolution.

As mentioned above, ulcerative colitis and Crohn's disease have some similarities but it's important to understand the difference between both the diseases [4-6]. Crohn's disease doesn't aim to any particular part of the Gastrointestinal (GI) tract, but ulcerative colitis affects only the colon and rectum. Additionally, Crohn's disease can affect all layers of the bowel wall, while UC only affects the lining of the colon. Various components are responsible for the pathogenesis of inflammatory bowel disease such as environmental factors which can be NSAIDs that is Non-Steroidal Anti-Inflammatory Drugs, genetic history, host intestinal flora and the host immune system. Non-steroidal Anti-inflammatory Drugs (NSAIDs) are supposed to be the cause of many severe upper gastrointestinal complications, but still

### Statistics

Statistics analysis for ulcerative colitis and Crohn's disease showed that each year there was approximately 38,000 new cases per year which are diagnosed with ulcerative colitis. Crohn's disease and ulcerative colitis both diseases can affect people of any age group, but frequently people in between the ages of 15 and 35 are more common. Based on the Olmsted County study, the median age of diagnosis for ulcerative colitis and Crohn's disease was 34.9 years and 29.5 years. Inflammatory bowel disease affects both men and women equally. However, most North American studies show that UC is more common in men than in women. In addition, men are more likely to be diagnosed with UC compare to women in their 50's and 60's [7-9]. Geographically northern located population suffers more than southern locations in Europe and new cases are found in Canada, New Zealand, UK, and Scotland.

### Epidemiology

Initially patients with ulcerative colitis experience moderate symptoms but if one should not avoid the following symptoms: bowel movements become looser, constant diarrhea lead by abdominal pain along with blood in the stool. Because of persistent diarrhea patient can also experience loss of appetite and may lose weight as well. All this will cause low energy and fatigue. Younger children may suffer from delayed growth and development. Symptoms of UC don't remain constant and tends to come back in between [10-12]. This unpredictable course can cause a problematic situation for physician to assess about the effectiveness of treatment. Our immune system attacks our body against bacteria like in common cold but in UC it attacks against the cells that line colon of intestine and good gut bacteria because our immune system recognizes them as intruders in the body [13]. It causes inflammation and then ulcers.

## Extraintestinal features shows relation between UC and other disease

Clinical symptoms of UC show diarrhea along with mucus and blood which gradually extended to weeks which leads to weight loss and anemia. The extend of ulcerative colitis classify them into below categories:

Distal colitis limited to the rectum and extensive colitis as the name only suggests extending to the cecum where small intestine begins. As this disease progresses patients may suffer with different sign and symptoms from mild to severe condition which involves continuous bleeding and more than 10 bowel movements daily [14-17]. This condition can worsen and lead to death unless treated. During this disease 6% to 47% patients had showed complications and comorbidities outside of the colon as well that is extraintestinal features.

- Ulcers in the mouth known to be Aphthous Ulcer.
- Inflammation in the eye's iris i.e. Iritis.
- Musculoskeletal features affecting the joints of hands, feet, and arthritis of the spine.
- Inflammation of the bile ducts, anemia related disorders like deep venous thrombosis.
- Skin related disorders as well for example subcutaneous tissue inflammation.

Latest study showed the correlation between ulcerative colitis and Guillain-Barre Syndrome (GBS) [18]. Both the disease are autoimmune diseases, there are chances of having similar immunological procedures between them. In GBS, body's immune system starts to attack on the nerves. Initially patient may feel tingling sensation and weakness at extreme level, which is also the first

symptoms and eventually lead to paralysis to the whole body. Formerly, GBS was considered as an extra-intestinal indication of UC but in that it also includes the sensory system of our body [19-23]. Differences in the both the condition is that there are chances of having GBS at the last stage of lessening of UC, while extra-intestinal appearances of UC happens constantly and may last for long period. Pathogenesis of UC with GBS is vague and it might be identified with the accompanying elements: UC-related vasculitis, post-infection insusceptibility, ailing health, lethal metabolites, lack of vitamins in the body, and anemic condition. In the history, Ulcerative colitis with Guillain-Barré disorder was analyzed, related indications, normal cerebrospinal liquid albumin-cytological separation and proof of neurogenic damage through electromyography. Ulcerative Colitis sickness has indicated connection with Filiform Polyposis and Spondylo-arthropathy [24-26].

Causes which can be responsible for Ulcerative Colitis can be genetic factors, and environmental factors [27]. Genetic factors can be based on family history of the patient, genetic markers or linkages. Some environmental factors are also responsible for the pathogenesis of ulcerative colitis for example diet, and breastfeeding [28,29]. As our intestine exposed to the dietary substances directly in our daily life, they might play an important role in the pathogenesis of ulcerative colitis and Crohn's diseases. Table 1 shows the common differences between ulcerative colitis and Crohn's disease. Studies have shown such kind of associations for example uptake of high amount of vitamin B6 and unsaturated fats may increase the risk of ulcerative colitis. Along with that sulfur also found to be associated with UC, where it is related to gut microbiota [30,31]. History showed that breastfeeding is related to ulcerative colitis and Crohn's disease but not at higher level risk. More studies and sample size should be large for the validation between breastfeeding and ulcerative colitis/ Crohn's disease.

Categories	Ulcerative Colitis	Crohn's disease
Average Age	15-25 years	15-30 years
Gender	Male > Female > Children	
Geographical Distributon	Northern Locations > Southern Locations	Northern Locations > Southern Locations, Common in Ashkenazi Jews
Organ Affected	Colon	GI Tract
Endoscopy	Sigmoidoscopy Total colonoscopy	Colonoscopy Upper endoscopy
Surgery	After surgery, may come back	Considerd as cureable after surgery
Smoking factor	Common in ex-smokers	More Common
Fever	Indication towards severe problem	More Common
Weight Loss	Frequently	Infrequently

**Table 1:** Differences between UC and Crohn's Disease.

Human gut microbiota consists of various kinds of bacteria and species which are helpful for our body in their own ways. Imbalance within these bacteria which is known as dysbiosis can lead to development of any pathological disease such as inflammatory bowel disease. Sulfate reducing bacteria which is found in fecal material is found to be associated with ulcerative colitis, and desulfovibrio species is the common one [32,33]. It is found that the combination of sulfate

reducing bacteria which was obtained through biopsies from patients suffering from ulcerative colitis instigate apoptosis of epithelial cell line.

Inflammation of colon can lead to various disorders mentioned below:

**Primary Sclerosing Cholangitis:** Primary Sclerosing Cholangitis (PSC) which is characterized with the inflammation of bile ducts causing bile to drain from liver to the intestine results in long lasting disease and affects the expectancy of life. There is no effective treatment available for PSC [34,35].

**Autoimmune Hepatitis:** Normally hepatitis caused by the virus but autoimmune hepatitis is one exception. It occurs when immune cells attacks liver cells leads to scarring of liver and ultimately live failure.

**Gallstones:** Gallstones are the hardened stones like deposits in the gall bladder which can vary in size. Mostly they don't cause any symptoms but if get trapped in the duct then it might trigger abdominal pain.

**Pancreatitis:** Pancreatitis is characterized by the inflammation of pancreas. It is classifies into two: acute and chronic pancreatitis.

Diagnosis of ulcerative colitis includes blood test to check anemic condition, renal test, liver test to check the above mentioned disorders, X-ray, and Stool culture. Endoscopy is the best diagnosis for UC, sometimes full colonoscopy is also recommended to the patient only if the diagnosis part is unclear [36-39]. Differential diagnosis should also be considered as symptoms of ulcerative colitis and Crohn's disease are almost similar.

Medication for UC includes anti-inflammatory drugs 5-ASA that is 5-Aminosalicylic Acid drugs for example sulfasalazine and mesalazine and corticosteroids as well only for short time duration [40-42]. Alternative medicines which prefer for the patients are immune-suppressants drugs like azathioprine, infliximab, cyclosporine only in the case if 5-ASA medication doesn't work for the patient. In case of severe condition, surgical removal of the large intestine recommended [43-45].

## Discussion and Conclusion

Ulcerative colitis is one of the most commonly found autoimmune disorders in which around 2-14 people out of 100,000 were diagnosed per year. Ulcerative colitis is the inflammation of colon that is large intestine and rectum where stools are stored. Symptoms for UC are the persisting diarrhea with blood, and mucus/pus along with pain in the abdomen. Cause for UC is still unknown but studies shown the association of UC with other disorders as well. Patient may suffer from reoccurring pain based on their symptoms and other body parts may also suffer for example joint pain (arthritis), inflammation in the eye, and ulcers in the mouth.

Inflammation of colon can affect liver as well and may lead to disorders like Primary Sclerosing Cholangitis, Autoimmune Hepatitis, Gallstones, and Pancreatitis. Case report has shown that UC also associated with Guillain-Barré syndrome and Filiform Polyposis. There are some steps which one can take to eliminate the chances of getting ulcerative colitis for example avoiding foods like cabbage, beans, and spicy food.

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