

## Research Article

# Evaluation of clinical features, treatment options and complications in patients with inflammatory bowel disease

İnflamatuvar barsak hastalığı olan hastalarda klinik özellikler, tedavi seçenekleri ve komplikasyonların değerlendirilmesi

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## Abstract

**Introduction:** Inflammatory bowel diseases (IBD) form a group of inflammatory diseases occurring in genetically-susceptible people, which are characterized by chronic progression and whose cause is not fully known. The aim of this study is to determine the incidence of IBD in our region and examine the clinical characteristics, sociodemographic features, and treatment results of IBD patients.

**Methods:** Our study retrospectively investigates 211 patients over 18 years of age who were monitored for an IBD diagnosis between January 2, 2013, and December 31, 2019, by the gastroenterology department of Canakkale Onsekiz Mart University's Faculty of Medicine. The mean age, female-male ratio, smoking habits, disease severity, and localization sites were identified for included patients. Local and systemic complications of administered treatment types and reasons for surgical treatment were also assessed in patients.

**Results:** Of the 211 patients with IBD diagnoses, 158 (74.9%) had Ulcerative Colitis (UC) and 53 (25.1%) had a diagnosis of Crohn's disease (CD). The mean age at the time of diagnosis was 43.97±16.22 years for UC patients and 42.30±14.73 years for CD cases. The involvement sites for UC were distal colitis for 58.4% of patients, left colon for 24.1% of patients, pancolitis for 16.5% of patients, and backwash ileitis for 7% of patients. According to the treatment results, 152 (72.0%) patients took 5-aminosalicylate (5-ASA) alone, 48 (22.8%) took thiopurine, and 20 (9.5%) took anti-TNF.

**Conclusion:** Knowing the demographic, clinical, and laboratory features of these diseases, which are frequently seen in our region, can support the early identification of probable complications that may occur and the selection of appropriate approaches during diagnosis, treatment, and follow-up monitoring of these diseases.

**Keywords:** Inflammatory Bowel Diseases, Ulcerative Colitis, Crohn's Disease, Severity of Illness Index, Abdominal Pain, Diarrhea

## Öz

**Giriş:** İnflamatuvar barsak hastalıkları (İBH), genetik olarak duyarlı kişilerde meydana gelen, nedeni tam olarak bilinmeyen, kronik seyirli, bir grup inflamatuvar hastalıktır. Bu çalışmamızda İBH tanısı ile takip edilen hastaların sosyodemografik özellikleri, klinik özellikleri ve uygulanan tedavilerin incelenmesi amaçlandı.

**Yöntem:** Çalışmamızda Çanakkale Onsekiz Mart Üniversitesi, Tıp Fakültesi Gastroenteroloji bölümü tarafından 01.01.2013 ve 31.12.2019 tarihleri arasında İBH tanısı nedeniyle takip edilen 18 yaş üstü 211 hasta retrospektif olarak incelendi. Hastaların yaş ortalaması, kadın-erkek oranı, sigara kullanımı, hastalığın şiddeti ve yerleşim yeri tespit edildi. Hastalarda gelişen lokal ve sistemik komplikasyonlar, uygulanan tedavi tipleri ve cerrahi tedavi nedenleri değerlendirildi.

**Bulgular:** İBH tanısı alan 211 hastadan; 158'i (%74,9) Ülseratif Kolit (ÜK), 53'ü (%25,1) Crohn hastalığı (CH) idi. ÜK hastalarında ortalama yaş 43,97±16,22, CH'de 42,30±14,73 idi. Tutulum yerleri değerlendirildiğinde ÜK için %58,4 distal kolit, %24,1 sol kolon, %16,5 oranında pankolit, %7 oranında Backwash ileit mevcuttu. Tedaviler açısından değerlendirildiğinde 152 (%72,0) hastada tek başına 5-aminosalicylate (5-ASA), 48 (%22,8) hastada tiyopürin, 20 (%9,5) hastada anti TNF kullanımı saptandı.

**Sonuç:** Bölgemizde sıklıkla görülen bu hastalıkların demografik, klinik ve laboratuvar özelliklerinin bilinmesi; tanı, takip, tedavi aşamalarında uygun yaklaşımların seçilmesinde ve ortaya çıkabilecek muhtemel komplikasyonların erken saptanmasında fayda sağlayabilir.

**Anahtar kelimeler:** İnflamatuvar Barsak Hastalığı, Ülseratif Kolit, Crohn Hastalığı, Hastalık Şiddet İndeksi, Karın Ağrısı, İshal

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## Key Points

1. Fistula, stricture, joint involvement, and oral aphthae are more common in Crohn's Disease than in Ulcerative Colitis.
2. Bloody diarrhea without pain is the most common symptom of Ulcerative Colitis.
3. Pain with bloody diarrhea is a sign of Crohn's Disease.
4. Acetylsalicylic acid and thiopurine are first-line treatment options in both diseases.

## Introduction

Inflammatory bowel diseases (IBD) form a group of inflammatory diseases affecting the gastrointestinal region, which are characterized by chronic progression and whose etiology is unknown. There are two clinical forms of IBD, namely ulcerative colitis (UC) and Crohn's disease (CD). Endoscopic, radiological, and histopathologic investigations; laboratory tests; and patient and family histories are important for the differential diagnosis of UC and CD. However, 10–15% of cases cannot be fully classified and are said to have indeterminate colitis (IC) [1,2]. The incidence and prevalence of inflammatory bowel disease vary by geography [3-5]. In Turkey, the UC incidence is 4.4 per 100,000, and the CD incidence is 2.2 per 100,000 [6]. Both UC and CD can be diagnosed at any age; however, there are two age groups with peaks: the second and third decades, and the sixth and seventh decades. Adult-onset CD is observed slightly more in women, while UC is observed slightly more in men [5].

Ulcerative colitis causes mucosal inflammation in the colon and is a chronic inflammatory disease that involves relapses and remissions. It is most frequently observed in the rectum, where continuity is important for it to spread to other regions of the colon. It may involve the whole colon but rarely progresses to the terminal ileum (backwash ileitis) [7]. Crohn's disease is a chronic inflammatory disease that may involve the whole digestive system, from the mouth to the anus, with focal, asymmetrical, and transmural involvement as well [8]. Crohn's disease mostly involves the terminal ileum and cecum. However, the spread of CDs may vary. There may be oral, esophageal, and gastroduodenal involvement. Most often, the rectum is not involved, but nearly one third of patients experience perianal involvement [9]. A diagnosis of IBD is given based on the evidence of symptoms collected through radiological, endoscopic, and histopathologic methods. Ulcerative colitis is characterized most often by bloody diarrhea and chronic abdominal pain [10], while the most common symptoms for CD diagnosis (60–80% of patients) are abdominal pain, weight loss, and chronic diarrhea [9].

Determining inflammatory activity is important for identifying the appropriate approach to the disease, treatment, and prognosis. Clinical scoring and endoscopic indexes have been defined to support the identification of these methods and approaches. Currently, the Mayo, Montreal, Truelove Witts, and Rachmilewitz clinical and endoscopic activity scores are used for the diagnosis of and determination of disease activity for UC. For CD, the Harvey Bradshaw Clinical Index (HBI), CD Endoscopic Index of Severity (CDEIS), and Simplified Endoscopic Activity Score for CD (SES-CD) are used. The aim of this study is to determine the incidence of IBD in our region and examine the clinical characteristics, sociodemographic features, and treatment results of IBD patients that were admitted to our medical center between 2013 and 2019.

## Methods

Our study was designed as a retrospective investigation. The electronic files for 211 patients diagnosed with IBD and admitted to the COMU Training and Research Hospital gastroenterology clinic between January 2013 and December 2019 were extracted from the hospital's automated system. Patients with full medical records are considered eligible for the study. The exclusion criteria are defined as patients younger than 18 years of age and patients with diagnoses made before January 2013. Moreover, patients with indeterminate colitis and a lack of medical data are also excluded from the present study. The sociodemographic features of patients, clinical and laboratory findings, endoscopic features, involvement sites, applied treatments, complications, and hospitalization characteristics were recorded for all patients. The anatomic spread of the disease and type of involvement were also assessed according to the Montreal classification score widely used for IBD. The severity of UC was assessed based on the Mayo scoring, which has been used reliably for many years, and the severity of CD was measured based on the HBI.

## Ethical Approval, informed consent and permissions

An ethics committee approval was received from the Clinical Research Ethics Committee of Canakkale Onsekiz Mart University on January 6, 2020 by number 2011-KAEK-27/2019-21.

## Statistical analysis

Statistical analyses were conducted through the SPSS 22.0 program (SPSS Inc., Chicago, IL). The normal distribution was assessed with the Kolmogorov-Smirnov test. Descriptive statistics of categorical variables are measured as frequencies (percentage), while numerical variables are measured as mean  $\pm$  standard deviation (SD) and median (min-max).

## Results

**Table 1.** Demographic Characteristics of Cases with Inflammatory Bowel Disease

		Ulcerative colitis (n=158)	Crohn disease (n=53)	Total
<b>Age</b>	Mean $\pm$ SD	43.97 $\pm$ 16.22	42.30 $\pm$ 14.73	43.55 $\pm$ 15.84
	Median (min-max)	41.50(18-84)	42.00 (18-70)	41.50 (18-84)
<b>Sex</b>	Female, n	66 (41.8%)	27 (50.9%)	93 (44.1%)
	Male, n	92 (58.2%)	26 (49.1%)	118 (55.9%)
<b>Smoking</b>	Yes	79 (50.0%)	28 (52.8%)	107 (50.7%)
	No	79 (50.0%)	25 (47.2%)	104 (49.3%)

The demographic characteristics of patients in our study are summarized in Table 1. Of the 211 patients included in this study, 158 (74.9%) have UC and 53 (25.1%) have CD. Of these patients, 118 are men (55.9%) and 93 are women (44.1%). Of the UC patients, 92 are men (58.2%) and 66 are women (41.8%), while for CD patients, 26 are men (49.1%) and 27 (50.9%) are women. The mean age at the time

of diagnosis was 43.97±16.22 for UC patients and 42.30±14.73 for CD patients. The age distribution according to decade for patients is presented in Figure 1. Of all the cases, 107 (50.7%) smoked and 104 did not smoke at the time of their admission.

As for the symptoms at the time of diagnosis, the most common symptom was diarrhea, which was present in 190 cases (90.0%). Additionally, 121 of these patients (57.4%) were recorded as having bloody diarrhea. The number of cases with abdominal pain was 86 (40.8%). The most frequent symptom in UC was diarrhea, present in 155 cases (98.1%), while 104 of these patients (65.8%) were recorded as having bloody diarrhea. There were 49 cases with abdominal pain (31.0%). For CD patients, the most frequent reason for clinical admission was abdominal pain, which was recorded in 37 patients (69.8%). There were 35 patients who were admitted with diarrhea (66.0%), and 17 of these patients (32.1%) had bloody diarrhea. A colonoscopy assessment of the UC

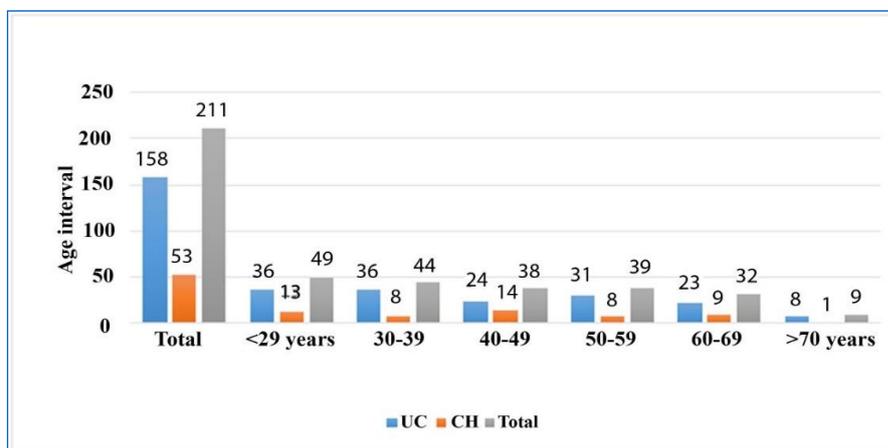


Figure 1. Age distribution of patients included in the study according to decade

patients identified distal colitis in 94 (59.4%) cases, proctitis in 47 (29.7%) cases, proctosigmoiditis in 47 (29.7%) cases, left colitis in 38 (24.1%) cases, and pancolitis in 26 (16.5%) cases. Additionally, 11 of the pancolitis patients were identified as having backwash ileitis. For CD patients, 27 experienced terminal ileum (50.9%), 12 experienced colon (22.6%), 10 experienced ileocolonic (18.9%), and 4 experienced upper GIS (7.5%) involvement. An additional seven (13.2%) experienced perianal involvement. With regard to clinical severity, for UC, 33 patients (20.9%) were mild, 114 patients (72.2%) were moderate, and 11 patients (7.0%) were severe. For CD, 21 patients (39.6%) were mild, 26 patients (49.1%) were moderate, and 6 patients (11.3%) were severe. In terms of complications, 12 (5.7%) had fistulas, 7 (3.3%) had strictures, 6 (2.8%) had an ileus, 5 (2.4%) had abscesses, 4 (1.9%) had malignancies, 1 (0.5%) had toxic megacolons, and 1 (0.5%) had a perforation. As for non-intestinal involvement, the most common observations were joint and eye involvement. Joint involvement was identified in 19 patients (9.0%), eye involvement in 8 (3.8%), skin involvement in 5 (2.4%), and primary sclerosing cholangitis (PSC) in 4 patients (1.9%) (Table 2).

Table 2. Clinical characteristics of study groups

	Ulcerative Colitis (n=158)	Crohn Disease (n=53)	p
<b>Complaint</b>	<b>n (%)</b>	<b>n (%)</b>	
Abdominal pain	3 (1.9)	18 (34.0)	<0.001
Fluid diarrhea	19 (12.0)	9 (17.0)	0.357
Bloody diarrhea	78 (49.4)	5 (9.4)	<0.001
Micaceous diarrhea	3 (1.9)	0 (0)	0.312
Pain + bloody diarrhea	9 (5.7)	9 (17.0)	0.020*
Pain + mucus diarrhea	29 (18.4)	9 (17.0)	0.822
Bloody + mucus diarrhea	9 (5.7)	2 (3.8)	0.586
Pain + bloody mucus diarrhea	8 (5.1)	1 (1.9)	0.322
<b>Total</b>	<b>158 (100)</b>	<b>53 (100)</b>	<b>&lt;0.001</b>
<b>Site of involvement</b>			
Proctitis	47 (29.7)	Terminal ileum	27 (50.9)
Rectosigmoid	47 (29.7)	Colon	12 (22.6)
Left colon	38 (24.1)	Ileocolon	10 (18.9)
Pancolitis	26 (16.5)	Isolated upper GIS	4 (7.5)
Backwash ileitis	11 (7.0)	Perianal involvement	7 (13.2)
<b>Disease Activity</b>			
Mild	33 (20.9)	21 (39.6)	0.008
Moderate	114 (72.1)	26 (49.1)	
Severe	11 (7.0)	6 (11.3)	
<b>Complications</b>			
Fissure	7 (4.4)	5 (9.5)	0.174
Pseudopolyp	15 (9.49)	1 (1.9)	0.078
Fistula	2 (1.3)	10 (18.9)	<0.001
Abscess	3 (1.9)	2 (3.8)	0.601
Stricture	1 (0.6)	6 (11.3)	<0.001
Ileus	4 (2.5)	2 (3.8)	0.642
Toxic Megacolon	1 (0.6)	0 (0.0)	0.562
Perforation	1 (0.6)	0 (0.0)	0.562
Malignancy	3 (1.9)	1 (1.9)	0.996
<b>Total</b>	<b>15 (9.5)</b>	<b>21 (38.9)</b>	
<b>Systemic involvement</b>			
Joint involvement	7 (4.4)	12 (22.6)	<0.001
Eye involvement	3 (1.9)	5 (9.4)	0.025*
Skin involvement	3 (1.9)	2 (3.8)	0.601
PSC	4 (2.5)	0 (0.0)	0.574
Oral Aphthae	7 (4.4)	14 (26.4)	<0.001
<b>Total*</b>	<b>18 (11.4)</b>	<b>23 (43.4)</b>	<b>&lt;0.001</b>

GIS, gastrointestinal system; PSC, primary sclerosing cholangitis; \*, one or more systemic involvement

The routine laboratory results of patients at the time of diagnosis are displayed in Table 3. For patients with UC, the median result of the leukocyte test was 8.0 (3.20 - 32.5)/ $\mu$ L, while it was 8.0 (0.6 - 23.3)/ $\mu$ L for patients with CD. For patients with UC, the median ESR was 24.5 (1.0 - 118.0)ml/s, and the median CRP was 0.5 (0.05 - 25.3)mg/dL. For CD patients, the median ESR was 28.0 (4.0 - 105.0)ml/s and the median CRP was 0.75 (0.01 - 42.0)mg/dL.

**Table 3.** Laboratory values of study participants at the time of diagnosis

	Ulcerative colitis (n=158) Mean (min - max)	Crohn disease (n=53) Median (min - max)
Hemoglobin (g/dL)	12.6 (7.4 - 17.5)	12.7 (7.0 - 16.9)
Hematocrit (%)	37.8 (24.1 - 51.5)	38.2 (22.0 - 49.1)
WBC ( $\times 10^3/\mu$ L)	8.4 (3.20 - 32.5)	8.3 (0.6 - 23.3)
Platelet ( $\times 10^3/\mu$ L)	314 (31 - 965)	275 (72 - 500)
Neutrophil ( $\times 10^3/\mu$ L)	5.2 (1.1 - 25.7)	5.0 (1.1 - 9.7)
Lymphocyte ( $\times 10^3/\mu$ L)	2.3 (1.2 - 10.7)	2.5 (0.3 - 17.4)
MCV (fL)	82.5 (53.1 - 96.2)	83.1 (61.6 - 96.1)
MPV (fL)	8.7 (5.7 - 12.1)	8.2 (6.3 - 10.7)
ESR (ml/s)	29.3 (1.0 - 118.0)	30.1 (4.0 - 105.0)
CRP (mg/dL)	2.3 (0.05 - 25.3)	2.8 (0.01 - 42.0)
Urea (mg/dL)	27.6 (7.0 - 146.0)	27.0 (9.2 - 85.7)
Creatinine (mg/dL)	1.3 (0.50 - 4.75)	0.8 (0.43 - 1.27)
Albumin (g/dL)	4.2 (1.81 - 5.44)	4.3 (2.11 - 5.35)
ALT (U/L)	18.8 (3.4 - 76.6)	25.5 (5.0 - 280.0)
AST (g/dL)	18.6 (6.0 - 67.3)	22.8 (6.0 - 142.0)

WBC, white blood cell; MCV, mean corpuscular volume; MPV, mean platelet volume; ESR, erythrocyte sedimentation rate; CRP, C-reactive protein; ALT, alanine aminotransferase; AST, aspartate aminotransferase.

With regard to applied treatments, 152 patients (72.0%) took 5-ASA alone, 50 (23.7%) took thiopurine, and 20 patients (9.5%) took anti-TNF. For UC, 128 patients (81.0%) took 5-ASA alone, 25 (15.8%) took thiopurine, and 11 patients (7.0%) took anti-TNF. For CD, 24 patients (45.3%) took 5-ASA, 25 (47.1%) took thiopurine, and 9 patients (17.0%) took anti-TNF. The analysis also found that 3.8% of UC patients and 15.1% of CD patients received surgical treatment. During follow-up monitoring, 46 patients (21.8%) were hospitalized for related problems. Of these patients, 26 had UC and 20 had CD (Table 4).

**Table 4.** Medical and surgical treatment of patients and assessment of hospitalization due to treatment

	Ulcerative colitis, n (%)	Crohn disease, n (%)	Total, n (%)
5-ASA	128 (81.0)	24 (45.3)	152 (72.0)
Thiopurine+5-ASA	19 (12.0)	20 (37.7)	39 (18.5)
Anti-TNF+5-ASA	5 (3.2)	4 (7.55)	9 (4.3)
5-ASA + Anti-TNF + Thiopurine	6 (3.8)	5 (9.45)	11 (5.2)
Anti-TNF (Total)	11 (7.0)	9 (17.0)	20 (9.5)
Surgical treatment	6 (3.8)	8 (15.1)	14 (6.6)
Hospitalization	26 (16.5)	20 (37.7)	46 (21.8)

5-ASA, acetylsalicylic acid; anti-TNF, Tumor necrosis factor-alpha inhibitor drugs.

## Discussion

According to epidemiological assessments, IBD is known to occur most often among patients between their second and third decades and between their fifth and sixth decades. A multicenter study in Turkey identified a similar age distribution, with two peak periods in the age ranges of 20–30 and 50–70 [6]. In our study, the mean age at diagnosis for UC was  $44.0 \pm 16.2$  years, while for CD, the mean age was  $42.3 \pm 14.7$  years. For all IBD patients, the mean age at diagnosis was  $43.6 \pm 15.6$  years. In terms of decades, a peak was observed below the age of 30, and a similar distribution was observed for other decades, with a clear reduction identified in the seventh decade and later.

In western societies, CD is reported to be slightly more common among women. On the other hand, there is no significant difference in sex for UC. Both CD and UC have a slight male dominance in eastern geographical regions [11,12]. Studies in Turkey have also identified a male predominance in UC and a female predominance in CD [13,14]. In our study, though this result was not statistically significant, male dominance was observed in UC patients (male/female: 1.4) and female dominance was identified in CD patients (male/female: 0.96).

The association of smoking habits between UC and CD has been investigated in many studies, which have yielded contradictory results. In the West, active smoking has been reported as associated with increased CD risk, while it is thought to have a protective effect against UC [15]. Studies have yielded different results about the impact of smoking on different ethnic groups [16]. Our study found no statistically significant effect of smoking on patients with UC and CD.

The clinical symptoms of IBD are proportional to the severity of the disease and the degree of its spread. One study on the clinical presentation of IBD including 1,397 patients reported that the most commonly observed symptoms were rectal bleeding in 96% of patients, diarrhea in 93% of patients, and abdominal pain in 55% of cases [17]. Another study including 3,100 IBD patients in the far east reported that the most common symptoms were abdominal pain in 67% of patients and bloody diarrhea in 48% of cases [18]. In our study, the main symptom observed in IBD

cases was diarrhea, with more than half of the patients experiencing bloody diarrhea and a little less than half of the patients experiencing abdominal pain.

While positive acute-phase reactants increase in cases of serum-linked active diseases, negative acute-phase reactants decrease. A variety of studies have reported that ESR, CRP, leukocytes, and platelets increase in relation to disease activity, while hemoglobin and albumin decrease in connection with disease activity. They may, however, remain within normal limits as the disease progresses [19,22]. Our study obtained similar data to the results presented in the existing literature. Leukocyte, hemoglobin, platelets, neutrophil, lymphocyte, and albumin mean values were found to be normal, while ESR and CRP mean values were high.

According to the Montreal classification, the disease involvement site is proctitis in 30–60% of UC patients, left colitis in 16–45% of patients, and pancolitis in 14–35% of cases [23]. Nearly one third of CD patients only experienced terminal ileitis, while nearly 50% had ileocolitis, and 20% had colon involvement. According to existing studies, perianal disease may be observed in 25% of CD patients during disease progression and is generally associated with colon involvement [24]. In our study, more than half of UC patients had distal colitis, nearly one quarter had left colitis, and there were even lower rates for pancolitis. These results can be considered compatible with existing literature. Studies in American society have identified that 45.1% of patients experience ileum involvement, 32% colon involvement, 18.6% ileocolon, and 4.2% upper GIS [25]. In our study, the most frequent area of involvement was the ileum+limited cecum, followed by the colon, ileocolon, and isolated upper gastrointestinal system, which is similar to the findings yielded for the US.

According to classifications of UC patients based on Mayo scores, upon admission, 20–25% of patients have mildly severe UC, 50–75% have moderate UC, and 10–20% have severe disease [26]. In a study including 454 UC patients in Norway, Henriksen et al. [27] reported that 36.3% were mildly severe, 52.4% were moderate, and 13.4% were severe cases. In our study, 20.9% of patients were mild, 72.1% were moderate, and 7.0% were severe cases, similar to the findings presented in existing literature with slight differences.

With regard to complications and extraintestinal involvement, a study in New Zealand identified that 27% of IBD patients developed complications, while 26.2% of patients diagnosed in Europe and 18.6% of patients in North America developed complications [25,28,29]. In our study, complications were observed in 36 patients (17.1%). Extraintestinal involvement in IBD varies between 6% and 47%, and joint, skin, and eye involvement are frequently observed [18, 30, 31]. In our study, the most frequent non-intestinal involvements identified were in the joints and eyes. The oral cavity is also frequently affected in IBD patients, especially in CD patients. Periodontitis, aphthous stomatitis, and pyostomatitis vegetans are found in more severe cases, in up to 10% of IBD patients [32]. In our study, oral cavity involvement was observed in 4.4% of UC patients and 26.4% of CD patients, yielding a total rate of 10.0%. Primary sclerosing cholangitis was identified more frequently in patients with UC than in those with CD. PSC affects approximately 2.4–7.5% of UC patients [33]. In our study, the rate of PSC was 2.5% in UC patients, and no PSC was identified in any CD patients.

The aim of medical treatment in IBD is to ensure remission in a short period of time, improve the patient's quality of life, reduce long-term steroid use requirements, and prevent complications with the disease and the medications used for treatment [34]. The main medications used for IBD treatment are anti-inflammatory, immunosuppressants, immunomodulators, antibiotics, and nutritional and supportive agents. Corticosteroids are not recommended for long-term use due to the risk of short- and long-term side effects, as well as resistance development. A study of 231 UC patients in Poland found that 34% of patients took 5-ASA, 53% took a combination of 5-ASA preparations with steroids, and 11.69% took combinations of 5-ASA, steroids, and immunosuppressive medication [35]. A study by Wang et al. [18] including 3,100 UC patients stated that 76.2% of patients took 5-ASA, 61.8% took steroids, 2% took immunosuppressive treatment, and 3.8% took traditional Chinese treatments. The majority of the UC patients included in our study took 5-ASA monotherapy, with moderate levels of thiopurine and low levels of anti-TNF, which ensures remission. However, for CD patients, remission with 5-ASA monotherapy was lower compared to patients with UC who took thiopurine and anti-TNF, who experienced much higher rates. Surgical treatment was performed in 3.8% of UC patients and 15.1% of CD patients. A study in 2006 by Jiang et al. [36] identified surgical treatment rates at 3% for UC patients and 27% for CD. While these rates are not exactly the same as the results yielded in our study, they are quite similar.

Inflammatory bowel disease activity may require hospitalization for some patients due to complications and/or surgical treatment. In our study, the hospitalization rate was found to be 21.8% for IBD patients. A further subgroup analysis yielded a rate of 16.5% for UC patients and 37.7% for CD patients. The probable causes of higher rates in CD patients are thought to be associated with higher complication rates, severe disease activity rates, and patients' perceptions of abdominal pain as more serious.

## Limitations

This study has some limitations. Our retrospectively planned study included a limited number of patients. Clinical and laboratory data were not performed simultaneously in patients. Also, a control group could not be included in this study.

## Conclusion

Our study found no statistically significant efficacy for the development of UC and CD due to sex, age, or smoking. The age of disease incidence was identified most frequently to be below 30; however, there were no great differences observed for patients of other ages. This indicates that IBD can be contracted at any age with the presence of bloody diarrhea, abdominal pain, or other symptoms. It is thought that tests measuring WBC, neutrophil, lymphocyte, hemoglobin (presence of anemia), positive acute-phase reactants of sedimentation, CRP, and negative phase reactants of albumin can assist in diagnosing patients who are thought to have IBD. The rates of involvement sites (CD: terminal ileitis, colon, ileocolon, isolated upper GIS, perianal involvement; UC: distal colitis (proctitis, proctosigmoiditis), left colitis, pancolitis, backwash ileitis), disease activity, and extraintestinal involvements in IBD patients were found to be similar to rates presented in existing literature. Our study determined the number of patients with disease controlled by 5-ASA monotherapy was quite high. However, the results suggest that the use of

thiopurines and anti-TNF can increase remission rates in future periods or reduce the risk of complications developing. It is likely that the use of selective adhesion inhibitors will become more popular, and that perhaps more advanced and effective methods will be used for treatment in the future.

**Conflict of interest:** None.

	Author Contributions	Author Initials
SCD	Study Conception and Design	YB
AD	Acquisition of Data	MU, YB
AID	Analysis and Interpretation of Data	MU, FK,
DM	Drafting of Manuscript	MU, FK
CR	Critical Revision	FK, YB

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