Zagazig University Medical Journal
www.zumj.journals.ekb.eg
https://doi.org/10.21608/zumj.2025.353395.3801 Volume 31, Issue 4, April 2025
Manuscript ID:ZUMJ-2501-3801
DOI: 10.21608/zumj.2025.353395.3801

ORIGINAL ARTICLE

Clinical and Therapeutic Outcomes of Patients with Inflammatory Bowel Disease: An In-Depth Analysis

Sara Mohamed Salem, Afify Fahmy Afify, Ihab Barsoum Fahim, Aliaa Khalil Mohamed Ibrahim*, Ayman Magd Eldin Mohammad Sadek
Internal Medicine Department, Faculty of Human Medicine, Zagazig University, Zagazig, Egypt.

Corresponding author*: Aliaa Khalil Mohamed Ibrahim
Email: aliaaagha887@gmail.com

Submit Date: 15-01-2025
Accept Date: 30-01-2025

ABSTRACT:

Background: Inflammatory bowel disease (IBD), which includes ulcerative colitis (UC) and Crohn's disease (CD), is becoming increasingly prevalent in North Africa—the current study aimed to evaluate IBD's clinical and treatment outcomes.

Methods: This retrospective cohort study was performed at the IBD clinic from June 2019 to July 2024. It included 208 cases with UC and 22 cases with CD.

Results: The differences in endoscopic outcomes regarding the type of therapy at 24 weeks follow-up were substantial (P <0.001). A decline in fecal calprotectin (F.C) ≤150 µg/mg was observed in 28.3% (17 cases) of the conventional group and 68.2% (101 cases) of the biological group, showing a highly significant difference in outcomes regarding the type of therapy at 48 weeks follow up (P <0.001). For clinical remission at 48 weeks, 29.3% of UC patients (61 out of 208) and 50% of CD patients (11 out of 22) achieved remission, with the difference being statistically significant (χ^2 = 3.954, P = 0.046).

Conclusions: Biological therapies, particularly anti-TNF agents and Ustekinumab, were more effective in achieving endoscopic remission. Ustekinumab demonstrated superiority over anti-TNF agents as there were no recorded complications associated with it, while conventional treatments led to higher steroid dependence.

Keywords: Biologic Therapy; Inflammatory Bowel Disease; Outcome.

INTRODUCTION

Crohn's disease (CD) and ulcerative colitis (UC) are both included in inflammatory bowel disease (IBD), a chronic inflammatory illness of the gastrointestinal tract (GIT). Relative to the general population, they mainly impact young people, changing their quality of life and raising morbidity [1].

Blood may be detected in the diarrhea that cases with UC typically present with. Rectal irritation results in frequent, small-volume bowel motions. Incontinence, tenesmus, urgency, and colicky belly pain are related symptoms [2].

CD is a long-term inflammatory GIT disorder that alternates between remission and recurrence. Localized stomach pain, persistent diarrhea, weight loss, exhaustion, anxiety, and depression are just a few of the symptoms that cases with CD may encounter [3].

Although the actual origin of IBD is still unknown, it is generally agreed that a variety of variables contribute to its etiopathology, including genetic susceptibility, malfunction of the mucosal barrier, disruptions of GIT microbiota, dysregulated immunological responses, environmental factors, and lifestyle habits [4].

According to a new analysis of the natural history of IBD, the incidence of UC rises first in Westernized nations, then CD. Both illnesses have surfaced in countries like Japan, Iran, India, South Korea, Lebanon, the French West Indies, Thailand, North Africa, and Egypt, where they were seldom ever previously documented [5].

Although the disease is a global concern, the United States, Sweden, and the United Kingdom have the highest incidences. Although the prevalence of IBD is rising across the Middle East and North Africa, epidemiological cohort investigations and a reliable registry remain barriers to assessing current affairs. Around the world, UC is more prevalent than CD. Although there is a shortage of information on the epidemiology of IBD in Egypt, some research indicates that the relative incidence ratio of UC and CD is 6:1 [5].

An investigation into the epidemiology of UC revealed a growing frequency in most Middle Eastern countries, which was validated by an investigation from Egypt that revealed a rise in newly confirmed cases during a ten-year period [6].

The present work aimed to assess the clinical and treatment outcomes of patients attending the IBD clinic at Zagazig University Hospitals in order to help reduce job limitations and the disease's social and economic burden on the community**.**

METHODS

A retrospective cohort study was performed on the cases of IBD in the outpatient clinic of the internal medicine department at Zagazig University Hospital (IBD clinic) From June 2019 to July 2024.

Cases with these features were included: male or female patients 18 years old or older with clinical, radiological, laboratory, and/or histopathological evidence of IBD. Patients who received treatment based on guidelines. Being on an outpatient basis, with strict adherence to management protocols. Patients agreed to follow up for about one year. Patients consent to enter the study.

We excluded cases with the following features: medical records lacking sufficient clinical data, non-adherent cases, and crossovers between treatment regimens—participants with poor follow-up, supporting labs, endoscopic results, and patients under 18 years old.Sample size

A total coverage sample was obtained by recruiting any case that met the inclusion parameters throughout the study period. The study included 230 participants with confirmed IBD.

All cases of the studied groups were conducted to complete history taking of clinical importance, complete clinical and general examination, endoscopy (Sigmoidoscopy, colonoscopy, and upper colonoscopy), and laboratory assessment (CBC, CRP, liver function (transaminases, serum albumin), ESR and fecal calprotectin, stool analysis for pus and blood, serum iron, ferritin, calcium, and vitamin D if needed).

Steps and Monitoring tools:

At the initial visit (Week 0) to our IBD clinic, we conducted a comprehensive evaluation of our patients, focusing on their disease's extent, classification, and activity. This assessment includes a scoring system that covers clinical, biochemical, endoscopic, and radiological evaluations. During the study period, we hold routine clinical visits at our IBD clinic and assess patients according to the Treat to Target (T2T) approach outlined in STRIDE-II.

Clinical assessments are performed every six months (Weeks 24 and 48) to determine the number of daily bowel motions, Partial Mayo Index Score of UC, bleeding per rectum, and Harvey-Bradshaw Index of CD.

Biochemical testing was performed every six months (Weeks 24 and 48) using laboratory assays of CRP and fecal calprotectin (FC) values. Endoscopic and histopathological evaluation of intestinal biopsies every 6 months (Weeks 24 and 48) by colonoscopy, Mayo score for UC, and simple endoscopic severity index for Crohn's disease (SESI-CD). Mayo score in ulcerative colitis: Normal (0): No inflammatory signs. Mild (1): Erythema,

decreased vascular pattern, mild friability. Moderate (2): Marked erythema, absent vascular pattern, friability, erosions. Severe (3): Spontaneous bleeding, ulcerations

Assess the patient's response to the therapy according to the Therapeutic Outcome in Inflammatory Bowel Diseases Guidelines (STRIDE) recommendation [7].

Statistical Methods

Data was analyzed utilizing Microsoft Excel software. The data were then imported into the SPSS (version 20.0 for Windows, Armonk, NY: IBM Corp) for further analysis. Qualitative data were presented as numbers and percentages for the analysis, while quantitative data were presented as mean ± standard deviation (SD). We use the Kolmogorov–Smirnov test to assess parametric and nonparametric variables. The following statistical tests assessed differences and associations: the Chi-square test (X^2) for qualitative variables, t-tests or Mann-Whitney tests for quantitative independent groups, and Kappa for agreement. A p-value <0.05 was considered significant.

RESULTS

The treatment distribution for the 208 ulcerative colitis patients revealed that all patients received conventional treatment with 72.6% (151 patients) received oral 5ASA, systemic steroids, and AZA. Regarding complications, 51.9% (108 patients) had complications, with osteoporosis in 45.2% (94 patients). Biological therapy was administered to 71.2% (148 patients) as first-line treatment. (Supplementary Table 1)

There were significant differences regarding Montreal classification, endoscopic grade, partial Mayo score, and laboratory data (CRP, hemoglobin, and fecal calprotectin) across all time points (P1 <0.001, P2 <0.001, P3 <0.001). Regarding pathology findings, Infiltration of the lamina propria was present in 100% of patients at all time points, and cryptitis significantly reduced over time (P <0.001). Crypt abscess was present and substantially reduced over time points (P <0.001). Thickening of the muscularis mucosa was noted in 1.4% (3 patients) at baseline, 1.9% (4 patients) at 24 weeks, and 0% at 48 weeks. McNemar's test showed highly significant differences for cryptitis and crypt abscess (P ≤0.001). (Table 1)

The differences in endoscopic outcomes regarding type of therapy at 24 weeks follow-up were statistically remarkable (P <0.001). (Table 2)

A decrease in fecal calprotectin (F.C) ≤150 µg/mg was observed in 28.3% (17 cases) of the conventional group and 68.2% (101 cases) of the biological group, showing a highly significant difference in outcomes regarding the type of therapy at 48 weeks follow up (P <0.001). (Table 3)

The treatment distribution for CD patients (N=22) revealed that 36.5% (8 patients) received conventional therapy with systemic steroids and azathioprine. Among those receiving traditional treatment, 75% (6 patients) were steroid intolerant, and 25% (2 patients) were steroid-resistant. Complications from conventional treatment were present in 75% (6 patients), with osteoporosis being the complication. For biological therapy, 36.4% (8 patients) received first-line anti-TNF treatments (Humira or Remicade). Among the first-line biological therapy group, 13.5% (3 patients) had complications such as fungal infection, testicular abscess, and trigeminal herpes. There were no patients with secondary biological failure, and all patients receiving second-line therapy (Stelara or Remicade) had no complications. During pregnancy, 100% (1 patient) received Remicade/Imuran. (Supplementary Table 2)

Regarding SESICD, the changes were statistically significant (P1 <0.001, P2 0.018,

and P3 <0.001), indicating improvements in disease activity over time. Concerning HIBI, the changes were statistically significant (P <0.001) for all time points, indicating a marked improvement in disease activity over the follow-up period. Regarding laboratory data, the differences were statistically significant (P = 0.002 for 24 weeks, P = 0.005 for 48 weeks, and P = 0.001 for the overall period), indicating a notable improvement in hemoglobin levels over time. Respecting the pathology data, the reduction in thick muscularis mucosa was statistically significant at 24 weeks (P = 0.004) and 48 weeks (P = 0.008), suggesting a notable improvement over the follow-up period. (Table

The differences in the treat-to-target strategy (T2T) of STRIDE-II recommendations regarding the response of treatment at 24 weeks of follow-up were non-statistically substantial (p>0.05). (Table 5)

At the 48-week follow-up, the response to treatment based on STRIDE-II recommendations showed the following results for UC and CD patients. For clinical remission, 29.3% of UC patients (61 out of 208) and 50% of CD patients (11 out of 22) achieved remission, with the difference being statistically significant ($\chi^2 = 3.954$, P = 0.046). (Table 6).

Supplementary Table (1) Distribution of the Ulcerative Colitis patients according to treatment:

	N=208	%
Conventional treatment		
5ASA, oral, systemic steroid, AZA	151	72.6%
5ASA, oral, supp, systemic steroid	20	9.6%
5ASA, oral, systemic steroid	24	11.5%
5ASA, supp, systemic steroid, AZA	12	5.8%
Oral ASA	1	0.5%
Treatment during pregnancy	N=22	
Oral 5ASA,Systemic steroid, AZA	6	27.2%
Oral 5ASA, Systemic steroid	6	27.2%
Oral 5ASA	4	18.2%
AZA	2	9.2%
No treatment	4	18.2%
Complications		
Present	108	51.9%
Osteoporosis	94	45.2%
Diabetes	6	2.9%
Cataract, arthritis	2	1%
Osteoporosis, perianal abscess	2	1%
Minute abscess	2	1%
Hip replacement due to AVN	2	1%
Absent	100	48.1%
Response to steroid		
Steroid responder	60	28.8%
Steroid dependent	64	30.8%
Steroid intolerant	44	21.2%
Steroid resistant	40	19.2%
Biological therapy	**N=208**	100%
First line	148	71.2%
Anti-TNF, Humira	94	45.2%
Anti-TNF, Remicade	54	26%
Second line	N=28	13.5%
Stelara	26	12.5%

Anti-TNF, Remicade	2	1%
Complications of first-line	N=148	
Multiple abscesses	8	5.4%
No	140	94.6%
Cause of failure of 1st line biological	n=28	
Primary non-responder to anti-TNF	20	71.4%
Secondary non-responder to anti-TNF	6	21.4%
Primary non-responder to Humira	2	7.2%
Secondary non-responder to Humira	0	0%
Complications of second-line		
No	28/28	100%

ASA: Azathioprine, 5-ASA: Aminosalicylic acids, TNF: Tumer Necrosis Factor, AVN: Avascular Necrosis

Supplementary Table (2) Distribution of the Crohn's Disease patients according to treatment:		
	N=22	%
Conventional treatment		
Systemic steroid + azathioprine	8	36.5%
No	14	63.5%
Response to Conventional Therapy		
Steroid intolerant	6/8	75%
Steroid resistant	2/8	25%
Complications of conventional therapy		
Present	6/8	75%
Osteoporosis	6/6	100%
Absent	2/8	25%
Biological therapy		
First line		
Anti-TNF, Humira	8	36.4%
Anti-TNF, Remicade	14	63.6%
Second line	2	9%
Present Stelara	1	4.5%
Anti-TNF, Remicade	1	4.5%
Absent	20	91%
Treatment during pregnancy		
Remicade/Imuran	1/1	100%
Complications of first-line		
Present	3	13.5%
Fungal infection	1	4.5%
Testicular abscess	1	4.5%
Trigeminal herpes	1	4.5%
Absent	19	86.5%
Cause of shifting from 1st line biological		
Primary biological failure	2/22	9%
Secondary biological failure	0/22	0%
Complications of second-line		
No	2/2	100%

ASA: Azathioprine, 5-ASA: Aminosalicylic acids, TNF: Tumer Necrosis Factor, AVN: Avascular Necrosis.

Table (1) Distribution of the Ulcerative Colitis patients according to Montreal classification, endoscopic grade, partial Mayo score, pathology, and laboratory data over the follow-up period:

	Baseline		**24 weeks**		**48 weeks**	
	N=208	**%**	**N=208**	**%**	**N=208s**	**%**
Montreal E1 E2 E3	 12 124 72	 5.8% 59.6% 34.6%	 31 135 42	 14.9% 64.9% 20.2%	 41 132 35	 19.7% 63.5% 16.8%
P	P1 <0001**		P2 <0.001**		P3 <0.001**	
Endoscopic Inactive Score 1 Score 2 Score 3	 0 4 78 126	 0% 1.9% 37.5% 60.6%	 32 50 86 40	 15.4% 24% 41.4% 19.2%	 54 92 46 16	 26% 44.2% 22.1% 7.7%
P	P1 <0001**		P2 <0.001**		P3 <0.001**	
Partial Mayo Score Remission Mild Moderate Severe	 0 61 121 26	 0% 29.3% 58.2% 12.5%	 24 83 89 12	 11.5% 39.9% 42.8% 5.8%	 56 104 44 4	 26.9% 50% 21.2% 1.9%
P	P1 <0001**		P2 <0.001**		P3 <0.001**	
Infiltration of lamina propria	208	100%	208	100%	208	100%
Cryptitis	143	68.8%	90	43.3%	78	37.5%
P			<0.001**		0.195	
Crypt abscess	151	72.6%	103	49.5%	54	26%
P			<0.001**		<0.001**	
Thick muscularis mucosa	3	1.4%	4	1.9%	0	0%
P			>0.999		0.125	
	Median (IQR)		**Median (IQR)**		**Median (IQR)**	
CRP	11.7(5 – 26.9)		8(4.5 – 15)		5.15(3.18 – 15.4)	
p (Wx)	P_1 <0.001**		P_2 <0.001**		P_3 <0.001**	
Fecal calprotectin	426(164.25 – 774)		224.5(140 – 723.75)		240.5(104.25 – 653.75)	
p (Wx)	P_1 <0.001**		P_2 <0.001**		P_3 <0.001**	
	Mean ± SD		**Mean ± SD**		**Mean ± SD**	
Hemoglobin	11.31 ± 1.97		11.75 ± 1.7		11.93 ± 1.8	
P (t)	P_1 <0.001**		P_2 <0.001**		P_3 <0.001**	
P for Wilcoxon signed rank test, significant, p1 difference between baseline and 24 weeks, p2 difference between 24 and 48 weeks, p3 difference between baseline and 48 weeks., CRP: c-reactive protein, IQR: interquartile range						

Table (2): Treat to target strategy of STRIDE-II recommendations in the studied cases according to type of therapy at 24 weeks follow-up of Ulcerative Colitis patients

T2T	Treatment				χ^2	P
	Conventional (n=60)		**Biological (n=148)**			
	No	**%**	**No**	**%**		
Clinical remission:	8	13.3	16	10.8	0.266	0.606
Normalization of CRP ≤ 6 mg/dl:	36	60	98	66.2	0.72	0.396
Decrease in F.C ≤150 µg/mg:	32	53.3	100	67.6	3.73	0.053
Endoscopic remission Partial Endoscopic remission Deep Endoscopic remission	24 10	40 16.7	26 22	17.6 14.9	12.984	<0.001**
χ^2: Chi square test						

Table (3): Treat to target strategy of STRIDE-II recommendations in the studied cases according to the type of therapy at 48 weeks follow up (end of the study) of Ulcerative Colitis patients:

T2T	**Treatment**				χ^2	**P**
	Conventional (n=60)		**Biological (n=148)**			
	No	**%**	**No**	**%**		
Clinical remission:	22	36.7	72	48.6	2.475	0.116
Normalization of CRP ≤ 6 mg/dl:	29	48.3	77	52	0.233	0.629
Decrease in F.C ≤150 µg/mg:	17	28.3	101	68.2	27.702	<0.001**
Endoscopic remission Partial Endoscopic remission Deep Endoscopic remission	24 40% 18 30		68 46 36 24.3		0.228	0.633
χ^2: Chi square test						

Table (4) Distribution of Crohn's Disease patients according to SESICD over the follow-up period:

	Baseline		**24 weeks**		**48 weeks**	
	N=22	**%**	**N=22**	**%**	**N=22**	**%**
SESICD Inactive Mild Moderate Severe	 0 3 13 6	 0% 13.6% 59.1% 27.3%	 3 9 8 2	 13.6% 40.9% 36.4% 9.1%	 11 6 5 0	 50% 27.3% 22.7% 0%
P1	P1 <0.001**		P2 0.018*		P3 <0.001**	
HBIs Remission Mild Moderate Severe	 0 2 11 9	 0% 9.1% 50% 40.9%	 3 9 7 3	 13.6% 40.9% 31.8% 13.6%	 11 2 9 0	 50% 9.1% 40.9% 0%
P	<0.001**		<0.001**		<0.001**	
Infiltration of lamina propria	22	100%	22	100%	22	100%
Cryptitis	12	54.5%	9	40.9%	3	13.6%
p	P1 0.453		P2 0.125		P3 0.065	

	Baseline		24 weeks		48 weeks	
	N=22	%	N=22	%	N=22	%
Crypt abscess	6	27.3%	6	27.3%	2	9.1%
p	P1 >0.999		P2 0.125		P3 0.125	
Thick muscularis mucosa	10	45.5%	9	40.9%	2	9.1%
p	P1 >0.999		P2 0.004*		P3 0.008*	
	Median (IQR)		**Median (IQR)**		**Median (IQR)**	
CRP	9.15(2.7 – 39.5)		8.5(3.15 – 43.25)		4.75(3.15 – 32.75)	
p			0.262		0.127	
Fecal calprotectin	418(187.5 – 1250)		226.5(105.5 – 680)		142.5(117.25 – 462.5)	
p			0.069		0.211	
	Mean ± SD		**Mean ± SD**		**Mean ± SD**	
Hemoglobin	11.6 ± 1.68		12.41 ± 1.59		12.77 ± 1.7	
P (t)	P_1 0.002*		P_2 0.005**		P_3 0.001**	
P for Wilcoxon signed rank test, significant, p1 difference between baseline and 24 weeks, p2 difference between 24 and 48 weeks, p3 difference between baseline and 48 weeks.						

Table (5): Treat to target strategy (T2T) of STRIDE-II recommendations in the studied cases according to the response of treatment at 24 weeks among Ulcerative Colitis (UC) and Crohn's disease (CD) patients.

T2T	Disease				χ^2	P
	UC (208)		CD (n=22)			
	No	%	No	%		
Clinical remission:	32	15.4	3	13.6	Fisher	>0.999
Normalization of CRP ≤ 6 mg/dl:	82	40.2	8	38.1	0.035	0.852
Decrease in F.C ≤150 µg/mg:	76	36.5	9	40.9	0.163	0.686
Endoscopic remission						
Partial Endoscopic remission	50	24	9	40.9		
Deep Endoscopic remission	32	15.4	3	13.6	2.756	0.097
χ^2: Chi square test						

Table (6): Treat to target strategy (T2T) of STRIDE-II recommendations in the studied cases according to the response of treatment at 48 weeks among Ulcerative Colitis (UC) and Crohn's disease (CD) patients.

T2T	UC (n=208)		CD (n=22)		χ^2	P
	No	%	No	%		
Clinical remission:	61	29.3	11	50	3.954	0.046*
Normalization of CRP ≤ 6 mg/dl:	91	44.6	9	40.9	0.11	0.74
Decrease in F.C ≤150 µg/mg:	90	43.3	12	54.4	1.025	0.311
Endoscopic remission						
Partial Endoscopic remission	92	44.2	6	27.3		
Deep Endoscopic remission	54	26	11	50	0.276	0.599
χ^2: Chi square test **p≤0.001 is statistically highly significant						

DISCUSSION

This study aimed to evaluate clinical and treatment outcomes for IBD (Ulcerative Colitis and Crohn's Disease) patients at Zagazig University Hospitals from June 2019 to July 2024. The study involved adult patients diagnosed through colonoscopy and pathological examination. First-line treatment consisted of traditional medical therapy, with a 28.8% response rate.

The prevalence of maximal treatment steps in our cohort included 5-ASA in 46.9% and corticosteroids in 16.3%, similar to findings by Kurti et al. [8], who reported these figures in a population-based cohort. In our study, 51.9% of patients experienced complications with conventional therapies, including osteoporosis (45.2%) and diabetes (2.9%), while 1% of patients had complications like cataracts, arthritis, and hip replacement due to AVN. These findings align with Elaziz and Fayed [9], who reported complications such as osteoporosis and cataracts in patients on conventional therapy.

Regarding biological treatment, 71.2% of patients received anti-TNF therapy as the first-line treatment and 13.5% received second-line biologicals, primarily Ustekinumab. This trend of increasing use of biologicals aligns with the work of Wewer et al. [10], who observed a significant rise in biological treatment use from 2010 to 2020, noting its beneficial effect on UC patients. Moreover, Kurti et al. [8] pointed out that the use of biological medications was reported in 9.9% of patients after three years of diagnosis, reflecting a trend similar to our study.

While the high costs of biological treatments were historically a barrier, many Egyptian clinics now provide these medications through health insurance and government funding. Infliximab and Adalimumab began in 2013, and Ustekinumab has become more prevalent recently. Regarding the efficacy of Ustekinumab, Gisbert et al. [12] reported 16% remission at week 48 and 68% at 3 years in randomized trials, with response rates ranging from 47% to 77% during induction and maintenance. Adverse events were generally low, with serious events reported in 3.7%-6% of cases, similar to findings in our study.

In our study, complications from first-line biological therapy occurred in 5.4% of patients, mainly due to multiple abscesses, while second-line treatment was used in 13.5% of cases, primarily Stelara. Notably, second-line therapy showed no complications (100%). This is consistent with the findings of Lasa et al. [13], who reported that anti-TNF therapies increased the risk of infections, particularly fungal and bacterial, and raised the risk of melanoma by 12%.

Regarding the extension of the disorder, our study showed that most UC cases had mild distal or left-sided colitis (approximately 59.6%), which responded well to medical treatment. According to the Montreal classification, significant changes were observed over time: E1 (proctitis) increased from 5.8% at baseline to 14.9% at 24 weeks and 19.7% at 48 weeks, while E3 (pancolitis) decreased from 34.6% at baseline to 20.2% at 24 weeks and 16.8% at 48 weeks. The E2 (left-sided colitis) category remained the most prevalent (64.9% at 24 weeks and 63.5% at 48 weeks).

In contrast, our study disagrees with Alharbi et al. [14], which identified the largest cohort of Arab UC cases in Saudi Arabia. Their study showed that 42.7% of cases had extensive UC (E3) based on the Montreal classification, with 51.3% in remission. The disagreement lies in the distribution of UC phenotypes: our study observed a trend towards more localized disease (E2, left-sided colitis), while Alharbi et al. [14] found a higher prevalence of E3 (extensive disease). This discrepancy may reflect regional differences in disease patterns, treatment responses, or patient demographics, with our cohort showing more localized disease and improvement over time compared to the higher prevalence of extensive disease in the Saudi cohort.

The partial Mayo score in our study showed significant improvement: at baseline, 58.2% had

moderate disease, and none were in remission. By 24 weeks, 11.5% had achieved remission; by 48 weeks, 26.9% were in remission, with more patients achieving mild disease and fewer severe cases.

This is consistent with Lewis et al. [15], who conducted a 12-week randomized trial of rosiglitazone for UC and found significant improvements in disease activity using the partial Mayo score, with 88% sensitivity and 87% specificity.

Additionally, Dubinsky et al. [16] analyzed the relationship between CRP and partial Mayo score (PMS) in UC patients, finding that changes in CRP and PMS at week 24 correlated with clinical response at week 48. These findings align with our study, suggesting that CRP and PMS alterations predict clinical response and effectiveness outcomes.

In our study, pathological findings showed significant improvements, with cryptitis decreasing from 68.8% at baseline to 37.5% at 48 weeks and crypt abscesses dropping from 72.6% to 26%. Lamina propria infiltration remained present in all patients, while thickened muscularis mucosa was rare and absent by 48 weeks. These results are consistent with Villanacci et al. [17], who studied 233 patients with active distal UC/proctitis and found significant improvements in histological inflammation, from 60.6% to 20% after treatment.

In terms of treatment, our study found that at 24 weeks, the treat-to-target (T2T) strategy showed no significant differences between conventional and biological therapies regarding clinical remission, CRP normalization, or fecal calprotectin reduction. However, biological therapy showed higher endoscopic remission rates. At 48 weeks, while clinical remission and CRP normalization remained similar, biological therapy significantly outperformed conventional therapy in reducing fecal calprotectin ($p < 0.001$), with no significant difference in endoscopic remission, that may be because we use biological therapy in patients not responding or intolerant or dependent on conventional therapy which in moderate to sever disease whose mucusa more friable and has more number and extent of ulcers but we use conventional therapy in mild to moderate disease with more better mucosa from the start…. Fecal cal protectin as inflammatory marker more observed and take little time than mucosal healing to produce its response to treatment .This aligns with Engström et al. [18], who found that infliximab significantly reduced fecal calprotectin and CRP, improved the Harvey-Bradshaw index for CD, and partial Mayo score for UC.

In our study, 36.5% of patients who did not respond to conventional treatment were switched to anti-TNF as the first-line biological therapy. This finding is consistent with Cheifetz [19], who noted that corticosteroids effectively induce remission in moderate to severe CD but fail to sustain it, with immunomodulators and biologics being the primary therapeutic options.

We also found complications in conventional therapy, with osteoporosis occurring in 75% of cases. First-line biological therapy (anti-TNF) had complications in 13.5%, including fungal infections, testicular abscesses, and trigeminal herpes. This is in line with Lasa et al. [13], who estimated the risk of infections with anti-TNF, particularly fungal and bacterial infections, and a 12% risk of melanoma. Anti-TNF therapy is known to raise the risk of serious diseases like tuberculosis and fungal infections.

In our study, 9% of patients used second-line therapy (mainly Ustekinumab) with no reported complications. This aligns with a survey by Ustekinumab, which showed better outcomes than anti-TNF. A multicenter trial found that Ustekinumab had a 73.9% remission rate at 6 months, compared to 42.7% for anti-TNF, and patients on anti-TNF had a higher likelihood of treatment cessation due to failure or disease progression ($p = 0.008$, $p = 0.003$). This is further supported by Ko et al. [21], who found Ustekinumab had better therapeutic durability and medication persistence compared to Infliximab and Adalimumab, with 12-month

persistence rates of 80%, 68%, and 64%, respectively.

Lastly, SESICD scores in our study showed significant improvement from baseline to 24 weeks and 48 weeks, with moderate improvement between 24 and 48 weeks ($p = 0.018$). This finding is consistent with Bouguen et al. [22], who found that mucosal healing and endoscopic improvement were achieved in many patients, with 50.7% achieving mucosal healing after a median follow-up of 62 weeks.

Over the follow-up period in our study, laboratory data showed significant improvements in hemoglobin levels, which increased from 11.6 ± 1.68 at baseline to 12.77 ± 1.7 at 48 weeks ($P < 0.001$). However, CRP and fecal calprotectin levels showed no significant changes during the follow-up. This is may be due to Both CRP and fecal calprotectin show a decline over the 48-week period, but the P-values suggest that the differences are not statistically significant at any of the time points (P1, P2, P3). This could be due to factors such as sample size, inter-patient variability, or the non-linear nature of biomarker changes in response to treatment. While the trend suggests clinical improvement, the statistical analysis does not support a significant reduction in these biomarkers over the follow-up period. urbanization This is consistent with Koutroubakis et al. [23], who found that hemoglobin levels remained stable in the first year after anti-TNF therapy. Still, improvements in Hb were associated with changes in CRP levels and the use of immunomodulators.

Regarding pathological findings, lamina propria infiltration remained unchanged in all patients, while cryptitis decreased from 54.5% at baseline to 13.6% at 48 weeks, indicating a trend toward improvement. Crypt abscesses dropped from 27.3% at baseline to 9.1% at 48 weeks, although the change was not statistically significant. Thickened muscularis mucosa showed considerable improvement, decreasing from 45.5% at baseline to 9.1% at 48 weeks.

These findings align with those of Clinton and Cross [24], who reported similar trends in pathological improvement, with cryptitis decreasing from 65% at baseline to 16% at 48 weeks, crypt abscesses dropping from 30% to 10%, and thickened muscularis mucosa improving from 50% to 11%.

One of the primary limitations of the present research is its relatively small sample size and the fact that it was carried out in a single center. The individuals with IBD recruited for the present study may not be representative of the IBD population as a whole because these individuals may have a more severe course needing hospitalization than those whose condition may be treated effectively from an outpatient setting. Future multicenter research with high sample sizes is required to corroborate these findings.

CONCLUSIONS

Our study at Zagazig University Hospitals highlights the disease outcomes associated with available therapeutic options. We found that biological therapies, particularly anti-TNF agents and Ustekinumab, were more effective in achieving endoscopic remission. Ustekinumab demonstrated superiority over anti-TNF agents, as no recorded complications were associated with its use. In contrast, conventional treatments resulted in higher dependence on steroids**.**

Ethics declarations

The study was conducted after obtaining approval from the Institutional Review Board (ZU-IRB#11423-3-1-2024) and written informed consent from all patients. The research was conducted under the World Medical Association's Code of Ethics (Helsinki Declaration) for human research.

Conflict of interest: The authors declare that they have no competing interest.

Financial Disclosure:

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors

REFERENCES

1 Cai Z, Wang S, Li J. Treatment of Inflammatory Bowel Disease: A

Comprehensive Review. Front Med (Lausanne). 2021;8:765474.
2. Tosca J, Garcia N, Pascual I, Bosca-Watts MM, Anton R, Sanahuja A, et al. Clinical assessment of risk factors for infection in inflammatory bowel disease patients. Int J Colorectal Dis. 2020;35:491–500.
3. Gomollón F, Gisbert JP, Guerra I, Plaza R, Pajares Villarroya R, Moreno Almazán L, et al. Clinical characteristics and prognostic factors for Crohn's disease relapses using natural language processing and machine learning: a pilot study. Eur J Gastroenterol Hepatol. 2022;34:389–97.
4. Kofla-Dłubacz A, Pytrus T, Akutko K, Sputa-Grzegrzółka P, Piotrowska A, Dzięgiel P. Etiology of IBD-Is It Still a Mystery? Int J Mol Sci. 2022;23:12445.
5. Elbadry M, Nour MO, Hussien M, Ghoneem EA, Medhat MA, Shehab H, et al. Clinico-Epidemiological Characteristics of Patients With Inflammatory Bowel Disease in Egypt: A Nationwide Multicenter Study. Front Med (Lausanne). 2022;9:867293.
6. Alsakarneh S, Ahmed M, Jaber F, Abuassi M, Mourad FH, Francis FF, et al. Inflammatory bowel disease burden in the Middle East and North Africa Region: a comprehensive analysis of incidence, prevalence, and mortality from 1990-2019. Ann Gastroenterol. 2024;37:527–35.
7. Peyrin-Biroulet L, Sandborn W, Sands BE, Reinisch W, Bemelman W, Bryant RV, et al. Selecting Therapeutic Targets in Inflammatory Bowel Disease (STRIDE): Determining Therapeutic Goals for Treat-to-Target. Am J Gastroenterol. 2015;110:1324–38.
8. Kurti Z, Gonczi L, Lakatos L, Golovics PA, Pandur T, David G, et al. Epidemiology, Treatment Strategy, Natural Disease Course and Surgical Outcomes of Patients with Ulcerative Colitis in Western Hungary - A Population-based Study Between 2007 and 2018: Data from the Veszprem County Cohort. J Crohns Colitis. 2023;17:352–60.
9. Elaziz MMA, Fayed A. Patterns of renal involvement in a cohort of patients with inflammatory bowel disease in Egypt. Acta Gastroenterol Belg. 2018;81:381–5.
10. Wewer MD, Arp L, Sarikaya M, Felding OK, Vind I, Pedersen G, et al. The Use and Efficacy of Biological Therapies for Inflammatory Bowel Disease in a Danish Tertiary Centre 2010-2020. Crohn's Colitis 360. 2022;4:otac041.
11. Eltabbakh M, Abd Alaty W, Sakr MA, Sherief AF. Commenting on the Letter (Completing the Picture in Egypt: Response to "Inflammatory Bowel Diseases in Egypt During the COVID-19 Pandemic"). Inflamm Bowel Dis. 2021;27:e66.
12. Gisbert JP, Parody-Rúa E, Chaparro M. Efficacy, Effectiveness, and Safety of Ustekinumab for the Treatment of Ulcerative Colitis: A Systematic Review. Inflamm Bowel Dis. 2024;30:292–302.
13. Lasa JS, Olivera PA, Danese S, Peyrin-Biroulet L. Efficacy and safety of biologics and small molecule drugs for patients with moderate-to-severe ulcerative colitis: a systematic review and network meta-analysis. Lancet Gastroenterol Hepatol. 2022;7:161–70.
14. Alharbi OR, Azzam NA, Almalki AS, Almadi MA, Alswat KA, Sadaf N, et al. Clinical epidemiology of ulcerative colitis in Arabs based on the Montréal classification. World J Gastroenterol. 2014;20:17525–31.
15. Lewis JD, Chuai S, Nessel L, Lichtenstein GR, Aberra FN, Ellenberg JH. Use of the noninvasive components of the Mayo score to assess clinical response in ulcerative colitis. Inflamm Bowel Dis. 2008;14:1660–6.
16. Dubinsky MC, Magro F, Steinwurz F, Hudesman DP, Kinnucan JA, Ungaro RC, et al. Association of C-reactive Protein and Partial Mayo Score With Response to Tofacitinib Induction Therapy: Results From the Ulcerative Colitis Clinical Program. Inflamm Bowel Dis. 2023;29:51–61.
17. Villanacci V, Antonelli E, Geboes K, Casella G, Bassotti G. Histological healing in inflammatory bowel disease: a still unfulfilled promise. World J Gastroenterol. 2013;19:968–78.

18. Engström J, Lönnkvist M, Befrits R, Ljung T, Diaz-Tartera H, Holst M, et al. Comparison of fecal calprotectin and serum C-reactive protein in early prediction of outcome to infliximab induction therapy. Scand J Gastroenterol. 2019;54:1081–8.
19. Cheifetz AS. Management of active Crohn disease. JAMA. 2013;309:2150–8.
20. Rivière P, Kanters C, Pellet G, Ni A, Hupé M, Aboulhamid N, et al. Comparative Effectiveness of Ustekinumab and Anti-TNF Agent as First-Line Biological Therapy in Luminal Crohn's Disease: A Retrospective Study From 2 Referral Centers. Inflamm Bowel Dis. 2023;29:923–31.
21. Ko Y, Paramsothy S, Yau Y, Leong RW. Superior treatment persistence with ustekinumab in Crohn's disease and vedolizumab in ulcerative colitis compared with anti-TNF biological agents: real-world registry data from the Persistence Australian National IBD Cohort (PANIC) study. Aliment Pharmacol Ther. 2021;54:292–301.
22. Bouguen G, Levesque BG, Pola S, Evans E, Sandborn WJ. Endoscopic assessment and treating to target increase the likelihood of mucosal healing in patients with Crohn's disease. Clin Gastroenterol Hepatol. 2014;12:978–85.
23. Koutroubakis IE, Ramos-Rivers C, Regueiro M, Koutroumpakis E, Click B, Schwartz M, et al. The Influence of Anti-tumor Necrosis Factor Agents on Hemoglobin Levels of Patients with Inflammatory Bowel Disease. Inflamm Bowel Dis. 2015;21:1587–93.
24. Clinton JW, Cross RK. Personalized Treatment for Crohn's Disease: Current Approaches and Future Directions. Clin Exp Gastroenterol. 2023;16:249–76

Citation

Salem, S., Afify, A., Fahim, I., Ibrahim, A., Sadek, A. Clinical and Therapeutic Outcomes of Patients with Inflammatory Bowel Disease: An In-Depth Analysis. *Zagazig University Medical Journal*, 2025; (1418-1430): -. doi: 10.21608/zumj.2025.353395.3801