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Clinical Characteristics, Treatment Outcomes, and Risk Factors for Complications in Ulcerative Colitis

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ABSTRACT

Background: Ulcerative Colitis (UC) is a chronic inflammatory bowel disease with significant morbidity. This study aimed to characterize clinical patterns, treatment responses, and risk factors for complications in UC patients. Methods: Data from 450 UC patients (aged ≥18 years) treated at a tertiary center (2021–2023) were retrospectively analyzed. Demographics, disease severity (Montreal classification), treatment modalities (5-ASA, immunosuppressants, biologics), and complications (colonic stricture, toxic megacolon, colorectal cancer) were evaluated. Multivariate logistic regression identified risk factors for severe complications.

Results: Median age at diagnosis was 32 years (IQR:25–40), with 52% male patients. Pancolitis (Montreal E3) was present in 38% (171/450), and 22% (99/450) had prior corticosteroid failure. Biologic therapy (adalimumab, infliximab) was initiated in 35% (158/450), achieving clinical remission in 68% at 12 months. Severe complications occurred in 12% (54/450), including strictures (6.7%) and toxic megacolon (3.3%). Multivariate analysis identified pancolitis (OR=2.89, 95%CI:1.62–5.16, $p<0.001$), corticosteroid failure (OR=2.17, 95%CI:1.28–3.68, $p=0.004$), and delayed diagnosis (>6 months) (OR=1.92, 95%CI:1.15–3.18, $p=0.013$) as independent risk factors for complications.

Conclusion: Pancolitis, corticosteroid failure, and delayed diagnosis increase the risk of severe complications in UC. Early initiation of biologic therapy in high-risk patients may improve outcomes.

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Introduction

Ulcerative Colitis (UC), a chronic relapsing-remitting Inflammatory Bowel Disease (IBD), affects over 2 million people worldwide, with increasing incidence in Asia and Africa [1]. While most patients experience mild-to-moderate symptoms, up to 30% develop severe complications such as colonic strictures, toxic megacolon, or Colorectal Cancer (CRC) [2]. Identifying high-risk subgroups and optimizing treatment strategies are critical for preventing morbidity and mortality.

Biologic therapies (e.g., anti-TNF agents) have revolutionized UC management, but their use is often delayed due to concerns about cost and safety [3]. Additionally, risk factors for severe complications—such as disease extent and treatment resistance—require clarification in real-world settings. This retrospective study analyzed clinical characteristics, treatment outcomes, and complication risk factors in UC patients to inform evidence-based care.

Materials and Methods

Patient Cohort

Data from 450 UC patients (diagnosed per Montreal criteria) treated at a tertiary center (2021–2023) were reviewed. Exclusion criteria: Crohn's disease, incomplete records, or follow-up <12 months. Data collected included demographics, disease extent (Montreal classification: E1=proctitis, E2=left-sided colitis, E3=pancolitis), treatment history, corticosteroid response, and complications.

Outcome Measures

- **Clinical Remission:** Defined as Mayo score ≤2 with no subscore >1 at 12 months.
- **Severe Complications:** Colonic stricture, toxic megacolon, or CRC.

Statistical Analysis

Categorical variables were compared using chi-square tests. Continuous variables used Mann-Whitney U tests. Multivariate logistic regression identified independent risk factors for complications. All analyses used SPSS 28.0, with $p<0.05$ considered significant.

Results

Baseline Characteristics

Median age at diagnosis was 32 years (IQR:25–40), with 234 males (52%). Key findings:

- Disease extent: E1=28% (126), E2=34% (153), E3=38% (171)
- Corticosteroid failure: 22% (99/450)
- Prior 5-ASA use: 85% (383/450)
- Biologic initiation: 35% (158/450, mostly adalimumab/infliximab)

Table 1: Patient Demographics and Disease Characteristics

Characteristic	Total (n=450)	Severe Complications (+) (n=54)	Severe Complications (-) (n=396)	*p*-value
Age ≥50 years (%)	18% (81/450)	33% (18/54)	16% (63/396)	0.002
Pancolitis (E3, %)	38% (171/450)	57% (31/54)	35% (140/396)	<0.001
Corticosteroid failure (%)	22% (99/450)	41% (22/54)	20% (77/396)	<0.001
Delayed diagnosis (>6 months)	35% (158/450)	52% (28/54)	33% (130/396)	0.008
Smoking (%)	15% (68/450)	22% (12/54)	14% (56/396)	0.23

Treatment Outcomes

- **Biologic Therapy Response:** 68% (107/158) achieved clinical remission at 12 months, compared to 45% (126/282) on traditional therapy (p<0.001).
- **Surgery Rate:** 8% (36/450) underwent colectomy, primarily for toxic megacolon (15 cases) or strictures (12 cases).

Table 2: Treatment Efficacy and Complications

Treatment Modality	n	Clinical Remission (%)	Severe Complications (%)	Median Follow-up (months)
5-ASA monotherapy	282	45%	8.5% (24/282)	24
Immunosuppressants (AZA/6-MP)	110	58%	10% (11/110)	26
Biologics	158	68%	6.3% (10/158)	22

Risk Factors for Severe Complications

Univariate analysis identified age ≥50, pancolitis, corticosteroid failure, and delayed diagnosis as risk factors. Multivariate analysis confirmed three independent predictors:

- Pancolitis (OR=2.89, 95%CI:1.62–5.16, p<0.001)
- Corticosteroid failure (OR=2.17, 95%CI:1.28–3.68, p=0.004)
- Delayed diagnosis (>6 months, OR=1.92, 95%CI:1.15–3.18, p=0.013)

Table 3: Multivariate Logistic Regression for Severe Complications

Variable	OR (95%CI)	*p*-value
Pancolitis (E3 vs. E1/E2)	2.89 (1.62–5.16)	<0.001
Corticosteroid failure	2.17 (1.28–3.68)	0.004
Delayed diagnosis (>6 mo)	1.92 (1.15–3.18)	0.013
Age ≥50 years	1.35 (0.78–2.34)	0.28

Discussion

This retrospective analysis of 450 UC patients highlights key clinical patterns and risk factors: Pancolitis (E3) was strongly associated with severe complications, likely due to extensive mucosal inflammation and increased risk of dysplasia [4]. Early identification of pancolitis may warrant aggressive therapy to prevent progression. Patients with corticosteroid failure had double the risk of complications, underscoring the need for timely escalation to biologics [5]. Delayed switch to biologic therapy in this subgroup may lead to avoidable morbidity. Delayed diagnosis (>6 months) was independently linked to complications, possibly due to uncontrolled inflammation.

Improved access to colonoscopy and biomarkers (e.g., fecal calprotectin) could reduce diagnostic lag [6]. Biologics achieved higher remission rates and lower complication rates than traditional therapies, aligning with recent guidelines [3]. Early use in high-risk patients (e.g., pancolitis, corticosteroid failure) may prevent severe outcomes.Single-center design, potential bias in biologic prescribing patterns, and lack of long-term cancer surveillance data. Future multicenter studies with genomic/microbiome profiling are needed to refine risk stratification.

Pancolitis, corticosteroid failure, and delayed diagnosis are key risk factors for severe complications in UC. Early initiation of biologic therapy in high-risk patients and efforts to reduce diagnostic delay may improve outcomes. Routine monitoring of disease extent and treatment response is essential for personalized UC management.

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