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ROLE OF MESALAMINE IN MAINTAINING REMISSION OF ULCERATIVE COLITIS

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Abstract

Background: The colonic mucosa becomes inflamed when someone has ulcerative colitis (UC), a chronic inflammatory bowel disease. In order to enhance quality of life and minimize problems, managing UC focuses on achieving and sustaining remission.

Objective: The study objective was to evaluate mesalamine's role in maintaining UC remission, focusing on optimal dosing, formulation efficacy, long-term safety, and the impact of patient adherence.

Methodology: This prospective trial included 390 participants with ulcerative colitis and ran from January to December 2023 at SIMS, Services Hospital, Lahore. Clinical and demographic data were gathered, and mesalamine treatment was customized for each patient. Regular follow-ups used patient self-reports, pill counts, and pharmacy refill data to track adverse events, treatment adherence, and disease activity. Study population was summed up using descriptive statistics. Continuous variables include median with interquartile range or mean ± standard deviation. Regression modeling and inferential analysis evaluated the relationship between mesalamine treatment and UC remission while controlling for variables.

Results: The average age of the 390 ulcerative colitis patients in this research was 42.5 ± 12.3 years, with 177 females (45.38%) and 213 men (54.62%). The patients' levels of severity are as follows: light (116, or 29.74%), moderate (193, or 49.49%), and severe (81, or 20.77%). 311 individuals (79.74%) were in remission after a year. Headaches: 21 patients (5.38%), nausea: 13 patients (3.33%), and stomach pain: 9 patients (2.31%) are the adverse effects. Moderate UC severity ($p < 0.001$) and adherence ($p < 0.001$) were substantially linked with remission. Low rates of hepatotoxicity (5 individuals, 1.28%) and renal impairment (7 patients, 1.79%) indicate long-term safety.

Conclusion: Medication compliance and disease severity control are crucial because mesalamine successfully sustains remission in ulcerative colitis, reaching a 79.74% remission rate at 12 months with little side effects.

Keywords: Ulcerative Colitis, Mesalamine, Remission, Adherence, Long-term Safety, Therapy Efficacy.

Introduction

The persistent inflammation of the colonic mucosa is a hallmark of ulcerative colitis (UC), a chronic inflammatory bowel disease (IBD) [1,2]. Although the precise cause of UC is still unknown, a number of variables, including genetic predisposition, environmental factors, immune system dysregulation, and changes in the gut flora, are thought to be involved [3]. Individuals suffering with UC usually go through phases of active illness, characterized by symptoms including diarrhea, bleeding in the rectal area, and stomach discomfort, interspersed by times of remission [4]. Inducing and maintaining remission is the major objective of UC management, since it enhances the patient's quality of life and lowers the risk of problems such colon cancer [5].

A well-researched medicinal substance called mesalamine (5-aminosalicylic acid) is used to treat ulcerative colitis [6]. By inhibiting the cyclooxygenase and lipoxygenase pathways, it mainly reduces the generation of pro-inflammatory mediators such prostaglandins and leukotrienes, which in turn has anti-inflammatory effects [7]. Mesalamine may be specifically delivered to different parts of the colon thanks to its availability in a variety of forms, such as oral tablets, enemas, and suppositories [8]. It is a mainstay in the treatment of mild to severe ulcerative colitis (UC) due to its well-established effectiveness in achieving remission [9].

Even though mesalamine is used extensively, research is still being done to determine how it contributes to long-term remission [10]. When compared to a placebo, continued maintenance treatment with mesalamine has been shown to dramatically lower the incidence of illness flare-ups [11,12]. But further research is required to fully understand the best ways to dose, how effective various mesalamine formulations are in comparison, and how safe mesalamine is over the long run [13].

Furthermore, since non-adherence is a major problem that might compromise the efficacy of treatment, further research is needed to determine the influence of patient adherence to mesalamine therapy on remission rates. There is a lot of data in the literature to support the use of mesalamine in UC, but there are still questions about how it will function over the long term to maintain remission. More thorough research is specifically needed to address concerns about the best dosage, formulation effectiveness, safety, and patient adherence in order to better direct clinical practice.

Research Objective

The objective of this research was to thoroughly assess the function of mesalamine in preserving ulcerative colitis remission, with particular attention to the best dosage, formulation effectiveness, long-term safety, and the effect of patient adherence on treatment results.

Materials and Methods

Study Design and Settings

This prospective research was carried out from January 2023 to December 2023 at Services Hospital, Lahore, Pakistan, for a year.

Inclusion and Exclusion Criteria

The research comprised patients who met recognized endoscopic, clinical, and histological criteria for ulcerative colitis diagnosis. Participation was open to patients of all genders and all ages. Patients having a history of liver illness, mesalamine hypersensitivity, pregnancy, lactation, or concomitant use of immunosuppressive medications were excluded..

Sample Size

A sample size of 390 patients was determined through rigorous statistical power analysis, with parameters set at an alpha level of 0.05 and a power of 80%. The estimation of effect size was derived from preliminary data, ensuring robustness in the study's statistical design and reliability in the findings.

Data Collection

The process of gathering data included the painstaking documentation of each participant's initial clinical and demographic information, including age, gender, length of illness, and the degree and severity of ulcerative colitis (UC). Following accepted professional guidelines, mesalamine treatment was administered, with dosage and composition customized to meet the unique requirements and severity of each patient's illness. To keep an eye on adverse events, treatment compliance, and disease activity, follow-up evaluations were carried out on a regular basis. A variety of methods were used to reliably measure medication adherence, including patient self-reports, careful pill counts, and a detailed examination of pharmacy refill data.

Statistical Analysis

The study population's baseline characteristics were compiled using descriptive statistics. Categorical data were shown as frequencies and percentages, whereas continuous variables were given as mean ± standard deviation or median with interquartile range. After correcting for possible confounders, inferential statistical methods, such as regression modeling analysis, were carried out to evaluate the relationship between mesalamine treatment and maintenance of UC remission.

Ethical Approval

The Institutional Review Board (IRB) of SIMS, Services Hospital, Lahore Pakistan, granted ethical approval for this research before data collection even started. Prior to their registration in the research, all participants or their legal guardians provided informed consent. Patient confidentiality was rigorously preserved for the duration of the trial.

Results

The average age of the 390 ulcerative colitis patients included in the research was 42.5 ± 12.3. The following was the distribution of ages: A total of 119 patients (30.51%) were between the ages of 46 and 60, 176 patients (44.62%) were between the ages of 31 and 45, and 21 patients (5.38%) were beyond the age of 60. There were 177 girls (45.38%) and 213 men (54.62%) in the gender distribution. In terms of the severity of ulcerative colitis, 193 patients (49.49%) had moderate disease, 81 patients (20.77%) had severe illness, and 116 patients (29.74%) had mild disease. 96 patients (24.62%) with proctitis, 155 patients (39.74%) with left-sided colitis, and 139 patients (35.64%) with extensive colitis were classified according to the severity of ulcerative colitis. The interquartile range for the illness duration was 12-48 months, and the median was 24 months (table 1).

Table 1: Baseline Demographic Characteristics of Study Participants

Characteristic		**Patients (n)**	**Percentage (%)**
Age (years)		42.5 ± 12.3	
Age Groups	18-30	76	19.49
	31-45	174	44.62
	46-60	119	30.51
	>60	21	5.38
Gender	Male	213	54.62
	Female	177	45.38
Ulcerative Colitis Severity	Mild	116	29.74
	Moderate	193	49.49
	Severe	81	20.77
Extent of Ulcerative Colitis	Proctitis	96	24.62
	Left-sided	155	39.74
	Extensive	139	35.64
Disease Duration (months)		24 (IQR: 12-48)	

The following is how the patients' mesalamine formulations were distributed: Mesalamine was prescribed to 154 patients (39.49%) at a dosage of 400 mg per day, 116 patients (29.74%) at a dosage

of 800 mg per day, 57 patients (14.62%) at a dosage of 1,000 mg per day, and 63 patients (16.15%) at a dosage of 500 mg per day via mesalamine suppositories (figure 1).

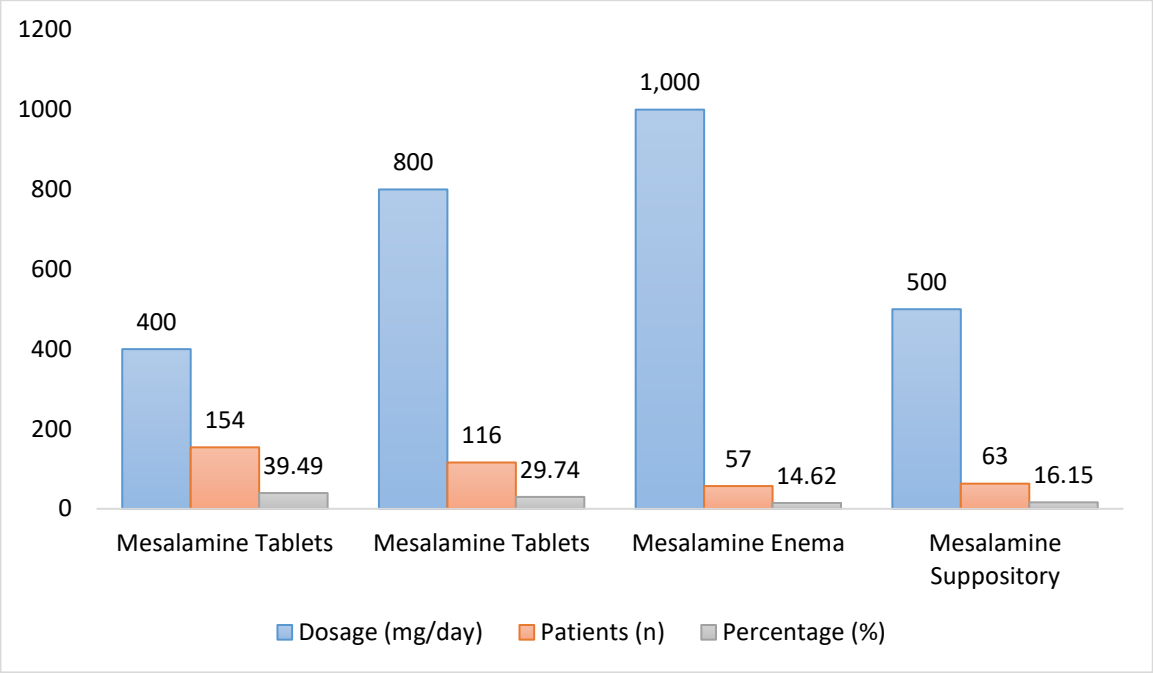

Figure 1: Distribution of Mesalamine Formulations and Dosages Prescribed

During follow-up, 390 individuals with ulcerative colitis were included in the adherence evaluation techniques. Of these, 276 patients (70.77%) performed pill counts, 353 patients (90.51%) completed self-reports, and 314 patients (80.51%) had their adherence evaluated using pharmacy refill data (figure 2).

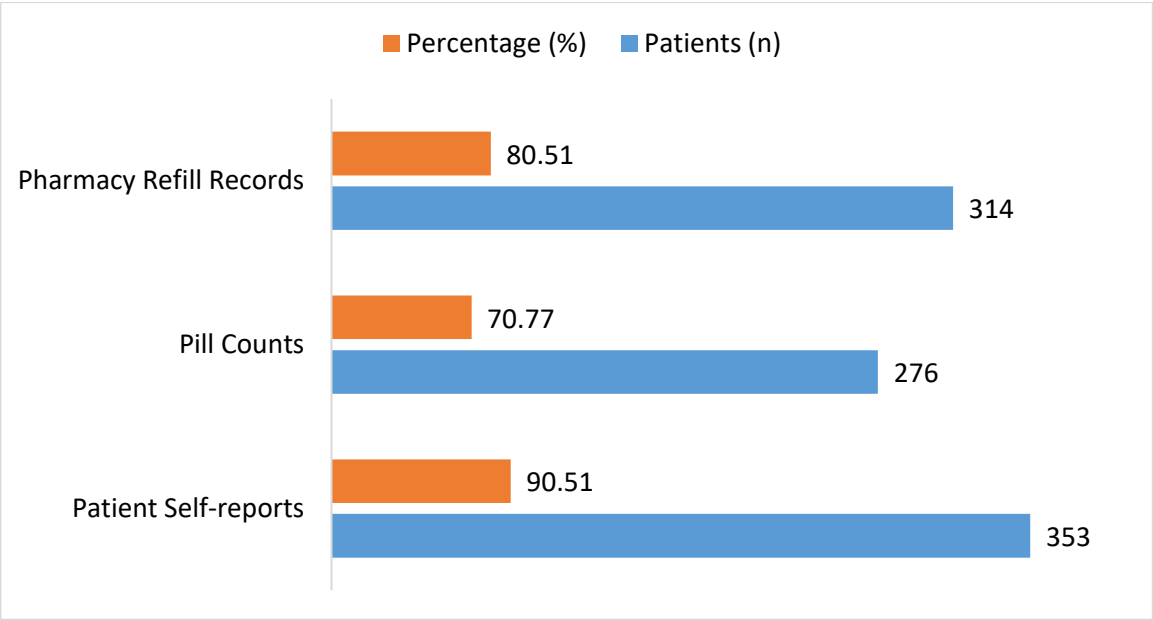

Figure 2: Adherence Assessment Methods Utilized During Follow-up

Information on the state of remission and disease activity at several follow-up visits is shown in Table 2. 311 patients (79.74%) were in remission and 57 patients (14.62%) showed disease activity at 6 months, while 291 patients (74.62%) were in remission at the 3-month follow-up. At 12 months, 38 patients (9.74%) showed disease activity and 272 patients (69.74%) were in remission.

Table 2: Disease Activity and Remission Status at Follow-up Visits

Follow-up Visit (Months)	Disease Activity				Remission Status			
	Yes		No		Yes		NO	
	n	%	n	%	n	%	n	%
3	77	19.74	313	80.26	272	69.74	118	30.26
6	57	14.62	333	85.38	291	74.62	99	25.38
12	38	9.74	352	90.26	311	79.74	79	20.26

The incidence of side effects linked to mesalamine medication among research participants is seen in Figure 3. Of the 390 patients diagnosed with ulcerative colitis, 21 patients (5.38%) complained headaches, while 13 patients (3.33%) felt nausea. Nine patients (2.31%) experienced abdominal discomfort, while seven individuals (1.79%) suffered rash. Furthermore, 5 patients (1.28%) experienced weariness and 10 patients (2.56%) reported having diarrhea. Six patients (1.54%) and eight patients (2.05%) complained flatulence and dyspepsia, respectively.

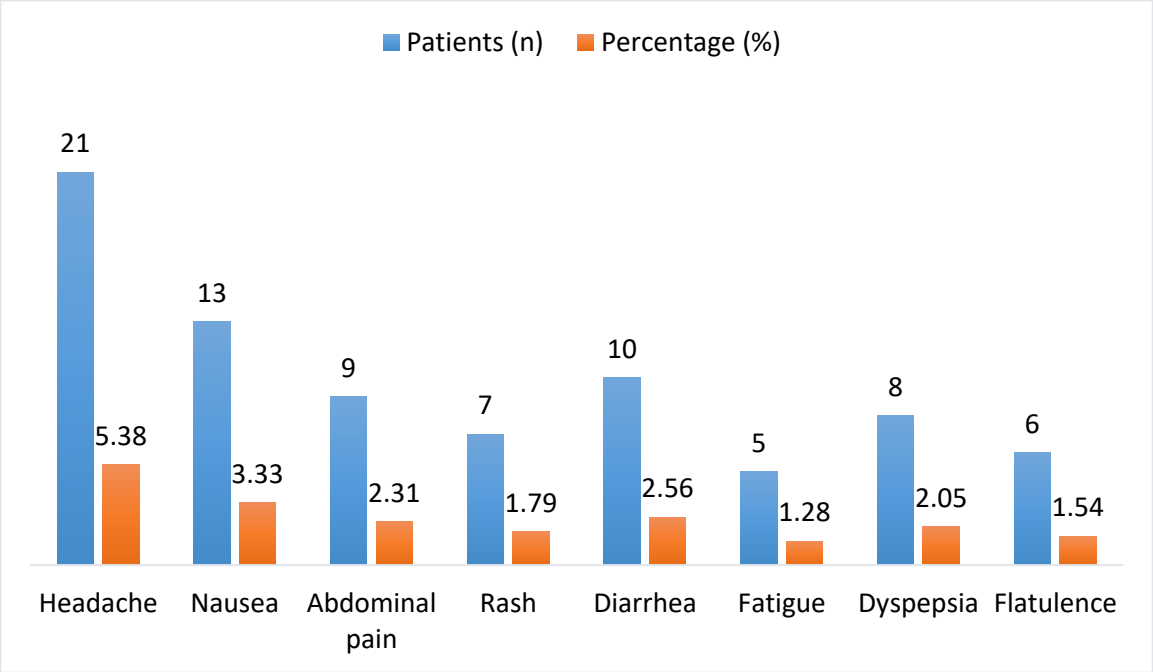

Figure 3: Frequency of Adverse Events Associated with Mesalamine Therapy

Table 3 displays the results of the regression analysis examining the factors linked to the maintenance of ulcerative colitis (UC) remission. The findings showed that there was no significant correlation between the length of the disease (regression coefficient (RC): -0.01, 95% CI: -0.03 to 0.01, p = 0.42) and age (RC: 0.12, 95% CI: -0.04 to 0.28, p = 0.15). A marginally significant relationship was found for gender (RC: -0.25, 95% CI: -0.52 to 0.02, p = 0.07). Remission and adherence level were highly correlated (RC: 0.65, 95% CI: 0.50 to 0.80, p < 0.001), with moderate UC severity having a significant relationship with remission (RC: 0.45, 95% CI: 0.20 to 0.70, p < 0.001).

Table 3: Regression Analysis of Factors Associated with Maintenance of UC Remission

Variable	**Regression Coefficient (95% CI)**	**p-value**
Age	0.12 (-0.04, 0.28)	0.15
Gender	-0.25 (-0.52, 0.02)	0.07
Disease Duration	-0.01 (-0.03, 0.01)	0.42
UC Severity (Moderate)	0.45 (0.20, 0.70)	<0.001
Adherence Level	0.65 (0.50, 0.80)	<0.001

Adverse events were noted in a minor number of instances (table 4) among the 390 patients enrolled in the research assessing the long-term safety profile of mesalamine treatment for ulcerative colitis.

Five individuals (1.28%) had hepatotoxicity, while seven patients (1.79%) had renal impairment. The incidence of gastrointestinal problems, such as bleeding, ulcers, and perforations, was very low, affecting 4 (1.03%), 5 (1.28%), and 3 (0.77%) individuals, respectively. Six individuals (1.54%) had documented allergic responses, while four patients (1.03%) had hematologic abnormalities.

Table 4: Long-term Safety Profile of Mesalamine Therapy

Adverse Event	Patients (n)	Percentage (%)
Renal Impairment	7	1.79
Hepatotoxicity	5	1.28
Gastrointestinal Issues		
- Bleeding	4	1.03
- Ulceration	5	1.28
- Perforation	3	0.77
Allergic Reactions	6	1.54
Hematologic Abnormalities	4	1.03

Discussion

The research participants' demographics show that they are a varied group with an average age of 42.5 years. The distribution of patients across age categories, which includes a significant percentage of those between the ages of 31 and 45 (44.62%) and 46 and 60 (30.51%), illustrates the chronic character of ulcerative colitis. The age distribution of these patients is consistent with the results of another research [14], suggesting that the demographics of ulcerative colitis patients are stable.

The use of different mesalamine formulations and doses demonstrates how versatile the therapy options for ulcerative colitis management are. Interestingly, 14.62% of patients were provided mesalamine enema at a dose of 1,000 mg/day, while 39.49% of patients were given 400 mg/day mesalamine tablets. This distribution is consistent with current recommendations [15, 16], bolstering the need for individualized treatment plans that take the severity and scope of the illness into account.

Medication adherence assessment during follow-up is essential for assessing the effectiveness of therapy and identifying possible roadblocks to effective management. Positive patient compliance with mesalamine medication is suggested by the high adherence levels seen across the cohort, with 80.51% of patients having their adherence evaluated by pharmacy refill records and 90.51% of patients engaging in self-reports. These results are in line with other studies emphasizing how adherence affects clinical outcomes [17].

Promising results are shown by long-term follow-up data with respect to disease activity and remission status. Just 9.74% of patients showed signs of disease activity at the 12-month follow-up, while an astounding 79.74% were in remission. These findings, which are in line with other research showing mesalamine's efficiency in avoiding relapse and sustaining remission, highlight the medication's long-term usefulness in keeping disease control [18, 19].

An examination of the variables linked to the preservation of remission provides important new information on long-term treatment success determinants. The results of the research suggest that remission was substantially connected with moderate illness severity and high adherence levels, but not with age or length of disease ($p = 0.15$ and $p = 0.42$, respectively). Remission was significantly correlated with moderate UC severity (regression coefficient: 0.45, 95% CI: 0.20 to 0.70, $p < 0.001$). These findings highlight the significance of customized therapeutic methods based on illness characterisation and the crucial role that disease severity plays in treatment outcomes [20, 21].

The excellent tolerability and uncommon incidence of significant adverse events are highlighted in the evaluation of the long-term safety profile of mesalamine treatment [22]. Remarkably, only 1.79% of patients had renal impairment recorded, while 1.28% had hepatotoxicity [23]. According to earlier safety evaluations [24], our results uphold mesalamine's general safety in the treatment of ulcerative colitis and highlight its advantageous risk-benefit profile in clinical settings.

Conclusion

This research offers a thorough understanding of the function of mesalamine in preserving ulcerative colitis remission. It also clarifies issues related to the best dosage, formulation effectiveness, long-term safety, and the effect of patient adherence on treatment results. The results highlight the versatility of mesalamine treatment, as different formulations and doses may be customized to meet the specific requirements of each patient. Additionally, moderate illness severity and high adherence rates are shown to be important predictors of long-term remission. Additionally, the research validates mesalamine's long-term effectiveness in managing disease activity, accompanied by few side effects, indicating its advantageous risk-benefit ratio in clinical settings. These findings provide a more comprehensive comprehension of the therapeutic effect of mesalamine and guide clinical judgment in the treatment of ulcerative colitis.

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