International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 2, February 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.2.2025.143

Original Research

Study of Clinical Profile of Anaemia in Patients with Inflammatory Bowel Disease

Dr. Arun Patted[1], Dr. Manjunath T. Shepur[2], Dr.Sharathchandra Khanappanavar[3], Dr.PreethamHurkadli[4]

[1]Assistant Professor, Department of Medical Gastroenterology, SDM College of Medical Sciences & Hospital, Shri DharmasthalaManjunatheshwara University, Dharwad, Karnataka, India.
[2]Assistant Professor, Department of Medical Gastroenterology, SDM College of Medical Sciences & Hospital, Shri DharmasthalaManjunatheshwara University, Dharwad, Karnataka, India.
[3]Assistant Professor, Department of Medical Gastroenterology, SDM College of Medical Sciences & Hospital, Shri DharmasthalaManjunatheshwara University, Dharwad, Karnataka, India.
[4]Associate Professor, Department of Medical Gastroenterology, SDM College of Medical Sciences & Hospital, Shri DharmasthalaManjunatheshwara University, Dharwad, Karnataka, India.

Corresponding Author
Dr. Arun Patted
Assistant Professor, Department of Medical Gastroenterology, SDM College of Medical Sciences & Hospital, Shri Dharmasthala Manjunatheshwara University, Dharwad, Karnataka, India.

Received: 21 December, 2024 Accepted: 30 January, 2025 Published: 26 February, 2025

ABSTRACT

Background: Anaemia is a common extra-intestinal manifestation of IBD (Inflammatory Bowel Disease), significantly impacting patients' quality of life. This study aims to evaluate the clinical profile and haematological parameters of anaemia in patients with IBD, focusing on CD (Crohn'sDisease) and UC (Ulcerative Colitis).

Methods: A prospective observational study was conducted at a tertiary care hospital from November 2019 to December 2021. Patients diagnosed with IBD and haemoglobin levels below gender-specific cut-offs (men: <13 g/dL, women: <12 g/dL) were included. Data on demographic, clinical, and laboratory parameters were collected using structured case report forms.

Results: The study included 100 patients (54% male, 46% female), with 69% diagnosed with Crohn's disease and 31% with ulcerative colitis. The majority (75%) were under 50 years old. The most common symptoms were abdominal pain (63%), fatigue (42%), and rectal bleeding (20%). Iron deficiency anaemia was predominant, with mean haemoglobin levels of 12.5 g/dL in CD and 12.3 g/dL in UC. Elevated CRP levels (mean: 17.7 mg/L) indicated active inflammation. Vitamin B12 deficiency was observed in 15% of patients, predominantly in CD.

Conclusion: Anaemia in IBD is multifactorial, with iron deficiency being the most common cause. Regular haematological screening and early intervention are crucial for improving patient outcomes.

Keywords: Anaemia, Inflammatory Bowel Disease, Crohn's Disease, Ulcerative Colitis, Iron Deficiency.

INTRODUCTION

IBD represents an idiopathic chronic disorder marked by acute and sub acute inflammation, ulceration, and systemic complications within the small intestine and colon, usually experiencing periods of remission and exacerbation.[1] The two major forms of IBD are distinguished mainly by their pathophysiological characteristics: one is CD(Crohn's Disease), which can affect any part of the gastrointestinal tract, while the other is known as UC (Ulcerative Colitis), which is typically limited to the colon.[2]

It represents the most frequent extra-intestinal manifestation of IBD, experienced by one-third of the affected patients.[3] Chronic blood loss, the malabsorption of iron and vitamin B12, and chronic disease anaemia are some underlying mechanisms.[4]The frequent cause of it is IDA, especially associated with the involvement of both effects: blood loss and reduced iron absorption from the intestine.[5] Vitamin B12 deficiency often occurs in those patients suffering from CD and this condition has occurred due to intestinal involvement.[6]

Despite its high prevalence, anaemia in IBD is usually underdiagnosed and undertreated. It has been documented that anaemia seriously affects the quality of life through fatigue, cognitive dysfunction, and increased rates of hospitalization.[7] The purpose of this study is to assess the clinical presentation and haematological parameters of anaemia in IBD patients, comparing CD and UC.

DOI: 10.69605/ijlbpr_14.2.2025.143

AIMS AND OBJECTIVES

The objective of this study was to consider an in-depth analysis of the clinical presentation and haematological parameters of anaemia in patients diagnosed with IBD. The primary focus was to establish the prevalence of anaemia in IBD patients and its correlation with disease activity and severity.

The study further aims to find specific haematological abnormalities in patients with IBD, such as iron deficiency anaemia, vitamin B12 deficiency, and anaemia of chronic disease. Anaemia profiles are compared between CD and UC in order to throw light on differences in their pathophysiology and management approaches. The study further aims to evaluate the impact of anaemia on the quality of life of the patients and evaluate the effectiveness of various treatment strategies.

MATERIALS &METHODS

A prospective observational study was conducted at Aster, a tertiary care hospital, from November 2019 to December 2021. Patients diagnosed with IBD and haemoglobin levels below gender-specific cutoffs were included.

Inclusion and Exclusion Criteria

Patients included in the study were adults (aged 18 years and above) diagnosed with IBD and having hemoglobin levels below gender-specific cutoffs (men: <13 g/dL, women: <12 g/dL). Only those willing to participate in the study were enrolled. Patients admitted to critical care wards, pregnant women, individuals with other causes of bleeding, those recovering from major surgery, and patients above 70 years of age were excluded from the study.

Sample Size Calculation

Based on the study by Eriksson et al., (2018),[8] the prevalence of anaemia among IBD patients was reported as 36%. Using 11% precision and a 95% CI (Confidence Interval), the required sample size was calculated to be 64. The sample size was determined using the formula:

$$n = \frac{1.96^2 p(1-p)}{d^2}$$

Where *n* represents the sample size, *p* is the prevalence of anaemia, *q* is (100 - *p*), and *d* is the allowable error.

Data Collection Methods

Data were collected using pretested semi-structured CRFs (Case Report Forms), ensuring consistency and accuracy. The CRFs captured socio-demographic information such as age, sex, and education level. Clinical data recorded included diagnosis, chief complaints, and history of presenting illness. Additional details encompassed past medical history, including chronic illnesses, personal history related to lifestyle and high-risk behaviours, and family history, given the genetic predisposition of IBD. Drug history was also recorded to identify potential allergies and assess on-going treatments.

Patients underwent comprehensive general and systemic examinations to confirm the diagnosis and evaluate disease progression. Laboratory investigations were performed to diagnose anaemia, classify its type and severity, and includeCBC (Complete Blood Count) parameters such as haemoglobin, hematocrit, red blood cell count, mean cell volume, and white blood cell count. Additionally, iron studies, including serum iron, serum TIBC(Total Iron-Binding Capacity), transferrin saturation, ferritin, and soluble transferrin receptor levels, were conducted to determine iron status.

Details of treatment, including medications, hospital stay duration, and complications, were systematically documented. Follow-up visits were scheduled at 1 month, 3 months, and 6 months to assess treatment outcomes and disease progression.

Statistical Analysis

Descriptive statistics were used to summarize demographic and clinical data. Quantitative data were expressed as mean ± standard deviation. Comparisons between groups were made using t-tests or ANOVA, with $p < 0.05$ considered statistically significant.

RESULTS

Age (Years)	Number of Patients	Percentage
<20	14	14%
21-30	18	18%
31-40	33	33%
41-50	20	20%
51-60	10	10%
>60	5	5%

Table 1: Demographic Distribution

In Table 1,the majority of patients (75%) were under 50 years old, with the highest incidence observed in the 31-40 age group (33%). This finding is consistent with previous studies that indicate IBD is most commonly diagnosed in early adulthood.

DOI: 10.69605/ijlbpr_14.2.2025.143

Sex	Number of Patients	Percentage
Male	54	54%
Female	46	46%
Table 2: Sex Distribution		

Table 2 shows theapproximately equal distribution of males (54%) and females (46%), suggesting no significant gender predisposition for anaemia in IBD.

Symptom	Number of Patients	Percentage
Abdominal Pain	63	63%
Fatigue	42	42%
Blood in Stool	20	20%
Fever	10	10%
Table 3: Clinical Presentation		

According to Table 3, the most commonly reported symptom was abdominal pain (63%), followed by fatigue (42%), which is a major feature of anaemia in IBD patients.

Parameter	CD (Mean)	UC (Mean)	p-value
Haemoglobin (g/dL)	12.5	12.3	0.70
MCV (fL)	82.3	79.8	0.18
Serum Iron (µg/dL)	32.9	23.0	0.044
Ferritin (µg/L)	71.6	13.9	0.0044
CRP (mg/L)	23.1	7.0	0.042
Table 4: Haematological Parameters			

In Table 4, the mean haemoglobin levels in CD (12.5 g/dL) and UC (12.3 g/dL) indicate mild anemia. Ferritin levels were significantly higher in CD, suggesting an inflammatory component.

DISCUSSION

Our study showed a male predominance, which may be explained by hospital referral bias, as male patients in our setting were more likely to seek healthcare due to social beliefs and stigma. This observation is contrary to that of Lucendo et al.,[9] who reported a more balanced gender distribution in their multicenter study. Our findings regarding gender distribution also differ from Filmann et al.,[10] who found a slight female predominance in their systematic review of European populations.

The age distribution was dominated by the 31-40 years group, accounting for 33% of the total, which corresponds to the common age at presentation. This is in line with Nielsen et al.,[11] who noted that anaemia is a common feature in IBD, often seen in the third and fourth decades of life.

CD was seen in 69% of patients, while UC was present in 31%. There is a higher prevalence of anaemia in CD than in UC. The causes are multifactorial, including iron and vitamin B12 malabsorption, blood loss from active ulcers, chronic disease anaemia, and effects of medications due to drugs like Azathioprine and Methotrexate. This pattern is similar to that observed by Kaitha et al.,[3] who described the multifactorial nature of anaemia in IBD, particularly in CD.

The mean MCV of 81 represented a mixed picture of microcytic and macrocytic anaemia, and mean CRP levels of 17.7 indicated high inflammatory activity. Low serum iron and transferrin saturation on the iron profile established iron deficiency as the major cause of anaemia, but normal mean ferritin levels suggested concomitant inflammation. This fits with Murawska et al,[12] who explained the complex interaction between iron deficiency anaemia and anaemia of chronic disease in IBD.

Only 42% of patients presented with primary features of anaemia, while others showed non-specific symptoms. The prevalence of anaemia in our study (44%) was comparable to European data reported by Filmann et al.,[9] who found prevalence rates ranging from 24% to 74%. Vitamin B12 deficiency was found in 15% of our patients, which falls within the range reported by Nielsen et al.[11]

Active IBD, especially CD, is associated with a CRP response in 40-80% of patients. Our observation of increased CRP activity aligned with findings from Lucendo et al.,[8] who demonstrated that elevated CRP levels correlate significantly with anemia severity. The relationship between inflammatory markers and anaemia severity has been well-documented by Kaitha et al.,[3] particularly in active disease states.

Disease location correlated considerably with severity in both anaemia and colonic CD. The findings of this study have been reinforced by Murawska et al.,[12] who described the impact of disease location on iron absorption and blood loss patterns in IBD.

Limitations

The study was limited by its small sample size and predominant focus on anaemic patients, restricting comparative analysis. Being conducted at a tertiary

DOI: 10.69605/ijlbpr_14.2.2025.143

care center, where more severe cases present, the observed anaemia prevalence may be higher than in the general IBD population. Additionally, the varied study population denominator may not accurately reflect true anaemia prevalence in the broader IBD community.

CONCLUSION

Anaemia is a common complication in IBD patients, with iron deficiency being the most prevalent cause. The study underscores the importance of regular haematological screening and early intervention to improve the quality of life in IBD patients. Further research with a larger sample size is needed to better understand the prevalence and types of anaemia in IBD.

REFERENCES

1. Hendrickson BA, Gokhale R, Cho JH. Clinical aspects and pathophysiology of inflammatory bowel disease. Clinical Microbiology Reviews 2002;15(1):79-94.
2. Zhang YZ, Li YY. Inflammatory bowel disease: pathogenesis. World JGastroenterol 2014;20(1):91.
3. KaithaS,BashirM,AliT.Irondeficiencyanemiaininflammatoryboweldisease.WorldJournalofGastrointestinalPathophysiology2015;6(3):62.
4. Kaplan GG, Ng SC. Globalization of IBD: perspectives from theEvolution of IBD in the United Kingdom and China. The LancetGastroenterology & Hepatology 2016;1(4):307-16.
5. Mulder DJ, Noble AJ, Justinich CJ, Duffin JM. A tale of two diseases: thehistory of inflammatory bowel disease. J Crohns Colitis 2014;8:341-8.
6. WilksS.Lecturesonpathologicalanatomy.London:Ongman,B.,Green,Longman,& Roberts 1859.
7. Wilks S. Morbid appearances in the intestines of Miss Bankes. MedTimes Gazette 1859: P. 264.
8. Eriksson C, Henriksson I, Brus O,Zhulina Y, Nyhlin N, Tysk C, et al. Incidence, prevalence and clinical outcome of anaemiain inflammatory bowel disease: a population-based cohortstudy. Aliment PharmacolTher 2018;48:638-45.
9. LucendoAJ, Arias Á, Roncero Ó, Hervías D, Verdejo C, Naveas-Polo C, et al. Anemia at the time of diagnosis of inflammatory bowel disease: prevalence and associated factors in adolescent and adult patients. Digestive and Liver Disease 2017;49(4):405-11.
10. Filmann N, Rey J, Schneeweiss S, Ardizzone S, Bager P, Bergamaschi G, et al. Prevalence of anemia in inflammatory bowel diseases in European countries: a systematic review and individual patient data meta-analysis. Inflammatory bowel diseases. 2014;20(5):936-945
11. Nielsen OH, Soendergaard C, Vikner ME, Weiss G. Rational management of iron-deficiency anaemia in inflammatory bowel disease. Nutrients 2018;10(1):82.
12. Murawska N, Fabisiak A, Fichna J. Anemia of chronic disease and iron deficiency anemia in inflammatory bowel diseases: pathophysiology, diagnosis, and treatment. Inflammatory Bowel Diseases 2016;22(5):1198-208.