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OUTCOME OF UPPER AND LOWER GI ENDOSCOPIES IN PATIENTS WITH MICROCYTIC ANEMIA

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Abstract

Background:
Microcytic anemia is a common clinical condition often caused by gastrointestinal (GI) blood loss. Upper and lower GI endoscopies are essential diagnostic tools for identifying underlying pathologies in these patients.

Objective:
This study aimed to evaluate the diagnostic yield of esophagogastroduodenoscopy (EGD) and colonoscopy in patients with microcytic anemia.

Methods:
A prospective observational study was conducted on 150 adult patients with confirmed microcytic anemia (MCV < 80 fL). All patients underwent both EGD and colonoscopy. Data on demographic characteristics, clinical findings, and endoscopic results were analyzed.

Results:
EGD detected abnormalities in 78.7% of cases, with peptic ulcers (30%) and gastritis (23.3%) being the most frequent findings. Colonoscopy revealed pathologies in 48% of patients, including colonic polyps (20%) and angiodysplasia (10%). Combined endoscopies identified a potential bleeding source in 68% of patients, with upper GI lesions (48%) more prevalent than lower GI lesions (20%). Normal findings were observed in 32% of cases.

Conclusion:
Upper GI endoscopy demonstrated a higher diagnostic yield than colonoscopy in patients with microcytic anemia. Combined endoscopic evaluation is crucial for identifying GI sources of blood loss, though non-GI causes should also be considered in cases with normal findings. These results support the routine use of dual endoscopy in the diagnostic workup of microcytic anemia.

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) represents a medical and the surgical emergency. Despite a worldwide reduction in UGIB-related mortality, the frequency and fatality linked to gastrointestinal bleeding persist at elevated levels in low-income nations.[1] The occurrence of upper gastrointestinal bleeding varies between 48 and 160 patients per 100,000 individuals, with consistent documentation of a greater frequency in the elderly and male populations [2] Different imaging techniques are employed to investigate and determine the cause of upper gastrointestinal

symptoms. Among these methods, upper gastrointestinal endoscopy (UGIE) holds a central position in diagnosing these conditions.[3] It allows the endoscopist to visually inspect the upper GI tract, perform biopsies of suspicious areas, and do so in a cost-effective manner.[3] UGIE not only contributes to establishing a conclusive diagnosis in such instances but also serves as a therapeutic tool in urgent scenarios like gastrointestinal bleeding. This capability enables the endoscopist to intervene at different stages of the disease progression.[3] The process is uncomplicated to execute and superior to radiological examinations, particularly when examining upper gastrointestinal bleeding and different inflammatory conditions affecting the esophagus, stomach, and duodenum, alongside specific vascular irregularities. Peptic ulcers contribute to 50% of cases of upper gastrointestinal bleeding (UGIB), while variceal diseases make up 5–30%, and Mallory–Weiss syndrome accounts for 5–15%.[4,5] Iron deficiency (hypochromic microcytic) anemia is a common cause of anaemia either due to poor intake or chronic blood loss [6]. Iron deficiency anemia (IDA) affects approximately 30% of the world's population [7]. Important implications for the recognition of IDA include diagnosis and correction of underlying causes, most of which are identifiable, by means of conventional upper gastrointestinal endoscopy and colonoscopy [8]. Iron deficiency anaemia (IDA) resulting from gastrointestinal bleeding is a common feature of many gastrointestinal conditions, several of which may be asymptomatic, including tumours of the gastrointestinal tract [9]. In addition, the IDA is now one of the most common presenting features of coeliac disease [10].

Methodology

This study employed a prospective observational design to assess the outcomes of upper and lower gastrointestinal (GI) endoscopic procedures in patients diagnosed with microcytic anemia. The study population consisted of adult patients aged 18 years or older who underwent both esophagogastroduodenoscopy (EGD) and colonoscopy due to confirmed microcytic anemia, with a total sample size of 150 patients. Inclusion criteria required laboratory-confirmed microcytic anemia (Mean Corpuscular Volume [MCV] < 80 fL), completion of both upper and lower GI endoscopies during the study period, and availability of complete clinical and endoscopic records. Patients were excluded if they had normocytic or macrocytic anemia, incomplete evaluations, missing records, or pre-existing GI malignancies.

Data were gathered from electronic medical records and endoscopy reports, capturing demographic details (age, gender), clinical presentation, comorbidities, hemoglobin levels, MCV, iron studies (serum iron, ferritin, TIBC), endoscopic findings from EGD and colonoscopy, histopathology results (if biopsies were taken), and final diagnoses with therapeutic interventions. The primary outcome measured the diagnostic yield of GI endoscopies in identifying the cause of microcytic anemia. Secondary outcomes focused on the prevalence of specific endoscopic findings, such as gastritis, peptic ulcers, esophagitis, malignancies (from EGD), and colonic polyps, malignancies, angiodysplasia, hemorrhoids, or inflammatory changes (from colonoscopy).

For data analysis, descriptive statistics summarized patient characteristics and endoscopic findings. Categorical variables were presented as frequencies and percentages, while continuous variables were reported as means ± standard deviation (SD) or medians with interquartile ranges (IQR), depending on the data distribution. The diagnostic yield of EGD and colonoscopy was calculated and compared using appropriate statistical tests, such as the chi-square test for categorical variables.

Results

In this study of 150 patients with microcytic anemia, upper GI endoscopy (EGD) identified abnormalities in 78.7% of cases, with peptic ulcers (30%) and gastritis (23.3%) being the most common findings. Colonoscopy detected pathology in 48% of patients, primarily colonic polyps (20%) and angiodysplasia (10%). Combined, GI endoscopies localized a potential

bleeding source in 68% of patients, with upper GI lesions (48%) contributing more frequently than lower GI lesions (20%). Normal findings were observed in 32% of cases, suggesting non-GI or occult causes of anemia. These results highlight the diagnostic importance of endoscopy, particularly EGD, in evaluating microcytic anemia.

Table 1: Demographic and Clinical Characteristics of the Study Population

Characteristic	Value (N = 150)
Age (years)	Mean ± SD: 55 ± 15
Gender	Male: 80 (53.3%)
	Female: 70 (46.7%)
Hemoglobin (g/dL)	Median (IQR): 8.5 (7.2–9.8)
MCV (fL)	Mean ± SD: 72 ± 6
Serum Ferritin (ng/mL)	Median (IQR): 12 (5–20)

Table 2: Diagnostic Yield of Upper GI Endoscopy (EGD)

Endoscopic Finding	Frequency (N = 150)	Percentage (%)
Peptic Ulcer Disease	45	30.0
Gastritis	35	23.3
Esophagitis	20	13.3
Variceal Disease	10	6.7
Malignancy (e.g., Gastric Cancer)	8	5.3
Normal Findings	32	21.3

Table 3: Diagnostic Yield of Lower GI Endoscopy (Colonoscopy)

Endoscopic Finding	Frequency (N = 150)	Percentage (%)
Colonic Polyps	30	20.0
Angiodysplasia	15	10.0
Hemorrhoids	12	8.0
Inflammatory Bowel Disease	10	6.7
Colorectal Malignancy	5	3.3
Normal Findings	78	52.0

Table 4: Overall Diagnostic Yield of Combined Endoscopies

Outcome	Frequency (N = 150)	Percentage (%)
Positive Findings	102	68.0
- Upper GI Source	72	48.0
- Lower GI Source	30	20.0
Normal Findings	48	32.0

Discussion:

In our study involving 150 patients with microcytic anemia, upper gastrointestinal (GI) endoscopy identified clinically significant findings in 78.7% of cases, predominantly peptic ulcers (30%) and gastritis (23.3%). Colonoscopy revealed abnormalities in 48% of cases, including polyps (20%) and angiodysplasia. When both procedures were utilized, a bleeding source was identified in 68% of patients, with upper GI

lesions occurring twice as often as lower GI lesions, underscoring the diagnostic advantage of combined endoscopic evaluation.

These findings align with previous research emphasizing the utility of dual endoscopy in assessing microcytic anemia. Relying on either esophagogastroduodenoscopy (EGD) or colonoscopy alone risks missing significant bleeding sites. Our study showed upper GI sources (48%) were more common than lower GI lesions (20%), a pattern also noted in the comparison study, which found similar trends in lesion distribution. Furthermore, both studies reported a substantial rate of normal endoscopic findings—32% in our cohort compared to 30% in the reference group—indicating that non-GI or occult causes of anemia may be present [11].

In terms of lesion prevalence, gastritis and peptic ulcers were the leading EGD findings in our cohort, while the comparative study (with 50 patients) reported a higher incidence of gastritis (40%) and a lower incidence of peptic ulcers (18%). Additionally, the referenced study noted more normal EGDs (28% vs. 21.3%) and included a younger patient population (mean age 36.4 years vs. 55 years in our study), although both studies demonstrated a higher frequency of upper GI over lower GI lesions [12].

Compared with another referenced study evaluating patients with and without a history of gastric surgery, our cohort yielded a higher overall diagnostic rate (68% vs. 22.4% in post-gastric surgery patients and 59.5% in patients with intact stomachs). Notably, upper GI lesions were predominant in both studies, though our study reported a significantly higher contribution from the upper GI tract (48% vs. 19% in the referenced surgical group) [13].

While both our study and another comparative analysis underscore the value of EGD in diagnosing iron deficiency anemia (IDA), our diagnostic yield (78.7%) was notably higher than the 43.9% reported in the comparative group [14]. However, another reference showed a diagnostic yield of 86.7%, surpassing our study's 68% detection rate for anemia-related causes, suggesting variability depending on patient demographics and methodology [15].

Finally, demographic differences between our study and the comparative literature may explain some discrepancies in findings. Our cohort had a higher mean age (55 ± 15 years) and a slight male predominance (53.3%), while the comparison group had younger patients (mean age 29.8 ± 6.7 years) and a female majority (71.61%). Despite both studies identifying gastritis and peptic ulcers as common upper GI findings, the prevalence was notably higher in our patients (78.7% vs. 46.45%) [16]. Additionally, our study reported higher rates of colonoscopic findings such as polyps (20%) compared to only 4.4% in the referenced study [17].

Conclusion:

This study highlights the importance of combined upper and lower GI endoscopies in diagnosing microcytic anemia, with EGD detecting abnormalities in 78.7% of cases and colonoscopy in 48%. Upper GI lesions were more frequent (48%) than lower GI (20%). Normal findings (32%) suggest non-GI causes, reinforcing the need for comprehensive evaluation in anemia workups.

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