

A cross sectional study to assess upper gi endoscopy findings in iron deficiency anemia in a tertiary centre in western Maharashtra

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Abstract

Aim: The aim of study was to assess upper GI scopy findings in iron deficiency anemia patients.

Methods: A Cross Sectional Observational Study was done on 100 patients admitted in ward or seen on OPD basis at Bharati Hospital and Research Center, Pune. Baseline investigations including hemoglobin, total leucocyte count, platelets with peripheral blood film, iron studies including: serum iron, total iron binding capacity (TIBC), transferrin saturation and ferritin were performed in all patients. All patients were subjected to fecal occult blood testing before endoscopy. All patients underwent upper GI endoscopy after taking written informed consent.

Results: There were 59 (59%) males and 41 (41%) females in the present study. Out of 100, 63 patients reported to have fatigue/lethargy, weight loss was observed in 29 patients. 17 out of 100 patients had the history of prior iron deficiency anemia therapy. 74% (n=74) cases had lesions identified on upper GI scopy while 26% (n=26) had normal upper GI scopy. The lesions on GI scopy were seen in esophagus among 17 patients, in stomach among 62 patients and in duodenum among 6 patients. Gastritis was the most common finding seen in 43% of cases followed by gastric ulcer (seen in 8% cases). Patients with fecal occult blood positive had statistically significant chance of having lesion in upper GI tract. The difference in the means of hemoglobin, TLC count, platelet count, MCV, level of

iron and TIBC did not differ significantly between the groups with normal and abnormal upper GI scopy.

Conclusion: In the present study fecal occult blood was statistically significant predictor of upper GI lesion in iron deficiency anemia. Majority (74%) of the cases had lesion which can be attributed to cause iron deficiency anemia. Hence, upper GI endoscopy should be considered as an important diagnostic modality for detecting cause of iron deficiency anemia in adults.

Keywords: upper GI scopy, anemia

Introduction

Anemia is characterized by a decrease in the total amount of haemoglobin or the number of red blood cells.¹ A global public health issue, anemia affects 1.62 billion people worldwide. Iron deficiency anemia is by far the most common cause of anemia.^{2,3} It is becoming increasingly clear that iron deficiency can cause symptoms unrelated to anemia and be linked to a number of diseases.⁴ In India, iron deficiency anaemia (IDA) is still a significant public health issue.

The WHO defines anemia as having a hemoglobin (Hb) level below 13 g/dL (hematocrit 39%) in men and below 12 g/dL (hematocrit 36%) in non-pregnant women. Iron deficiency anemia (IDA) is characterized by microcytic, hypochromic erythrocytes and low iron stores.² IDA is caused by a lack of iron or by chronic blood loss. Chronic Gastrointestinal (GI) blood loss causes iron deficiency anemia. The GI tract of IDA patients is routinely examined for bleeding lesions.⁵

GI lesions have been reported in 40–70% of patients with IDA.⁶

A positive fecal occult blood test and increasing age have been linked to endoscopic lesions in patients with IDA who have or have not had GI symptoms.⁷ The diagnosis and correction of underlying causes, most of

which are identifiable, can be achieved by upper gastrointestinal endoscopy and colonoscopy⁸

We found no major studies conducted from Western Maharashtra assessing upper GI endoscopic lesions in IDA despite IDA being commonly seen in this part. Hence a cross-sectional observational study was conducted with the aim to assess upper GI scopy findings in iron deficiency anemia patients.

Materials & methods

A Cross Sectional Observational Study was done at Bharati Hospital and Research Center, Pune and total 100 cases were included in the present study.

INCLUSION CRITERIA: a. Age: >18 years. b. Patients posted for upper GI scopy with Iron deficiency anemia. Iron deficiency anemia is defined as: Hemoglobin concentration < 13 g/dl for men (normal range, 13 to 17.2) and < 12 g/dl for women (normal range, 12 to 15.8) with at least one of the following laboratory values consistent with iron deficiency

1. Serum iron concentration ≤ 45 $\mu\text{g/dl}$ (normal range 50 to 150) with a transferrin saturation ≤ 15 percent (normal range 16 to 60 percent), 2. Serum total iron binding capacity (TIBC) of ≥ 400 $\mu\text{g/dl}$ (Normal range 250 – 400), Serum ferritin concentration ≤ 20 ng/ml for men (normal range 20 to 450) and ≤ 10 ng/ml for women (normal range, 10 to 250).

c. Patients giving informed consent to participate in the study voluntarily.

Exclusion criteria

a. Active bleeding (epistaxis, menorrhagia) b. Not willing to consent for upper GI scopy or esophagogastroduodenoscopy (EGD). c. Coagulation disorder d. Haemoglobinopathies.

Methodology

Eligible participants, already enlisted for EGD in view of Iron deficiency anemia, referred from outpatient clinic, admitted in ward or seen as a consulting at Bharati Hospital and Research Centre, Pune were enrolled after informed consent. Detailed history including leading questions for GI symptoms and physical examination was carried out. Baseline investigations including hemoglobin, total leucocyte count, platelets with peripheral blood film, iron studies including: serum iron, total iron binding capacity (TIBC), transferrin saturation and ferritin were performed in all patients. All patients were subjected to fecal occult blood testing before endoscopy.

Endoscopic procedures were performed in left lateral position to prevent chances of aspiration. Blood pressure, heart rate along with oxygen saturation were monitored every 5 minutes using cardiac monitors. All patients underwent Upper GI scopy. Bleeding related endoscopic lesions were biopsied. Duodenal and gastric biopsies were taken if no lesions are found on endoscopy. (To rule out coeliac disease and atrophic gastritis, H. pylori respectively as their initial presentation is that of iron deficiency anemia)

Statistical analysis

The data was collected and entered in Microsoft excel sheet and analyzed. The continuous variables were expressed as Mean \pm standard deviation (SD), and difference in the means was assessed using students 't' test. Frequency and percentages were calculated for categorical data, and compared using Chi-square test. Univariate analysis will be performed by using simple logistic regression for association between independent and outcome variables. A p value \leq 0.05 as a statistically

significant. The statistical analysis was done using SPSS version 26 software.

Results

Table 1: Patient details

	Frequency	Percent
Female	41	41.0
Male	59	59.0
Fatigue/lethargy	63	63.0
Weight loss	29	29.0
Prior IDA therapy	17	17.0
Addictions	14	14.0
Tobacco	5	5.0
Alcohol	10	10.0
Co-morbidities		
HTN	12	12.0
DM	8	8.0
DM + HTN	10	10.0
Others	17	17.0

The mean age of the patient was 50.58 \pm 15.79 years, ranging between 18 to 87 years. The mean duration of onset of symptom was 26.22 \pm 34.46 days, ranging between 1 to 180 days. There were 59 (59%) males and 41 (41%) females in the present study.

Out of 100, 63 patients reported to have fatigue/lethargy, weight loss was observed in 29 patients. 17 out of 100 patients had the history of prior iron deficiency anemia therapy. There were total 14 patients in whom addictions were reported, of those 10 patients were consuming alcohol and 5 patients were consuming tobacco.

Hypertension was reported to be the commonest comorbidity present in 12 patients, diabetes in 8 patients, 10 patients had diabetes as well as hypertension. 17 patients were reported to have other comorbidities.

Table 2: Abnormal findings of GI scopy

Lesions	N = 85	Percent
Esophagus (N=17)		
GERD	4	4.0
Esophageal varices	5	5.0
Esophageal Web	1	1.0
Esophageal stricture	2	2.0
Esophageal Ulcer	1	1.0
Esophageal Candidiasis	3	3.0
Esophageal submucous hemangioma	1	1.0
Stomach (N=62)		
Hiatus hernia	5	5.0
Gastritis	43	43.0
Gastric erosion	1	1.0
Gastric ulcer	8	8.0
Gastric Polyp	1	1.0
Ulceroproliferative growth in stomach	1	1.0
Portal Hypertensive Gastropathy	3	3.0
Duodenum (N=6)		
Duodenal ulcer	2	2.0
Duodenitis	2	2.0
Duodenal Polyp	2	2.0

The abnormal findings of GI scopy were seen in esophagus among 17 patients, in stomach among 62 patients and in duodenum among 6 patients.

Table 3: Association of site of lesion on UGI scopy and gender

Site of lesion on UGI scopy	Male	Female	Total
Esophagus	5	5	10
Stomach	30	21	51
Esophagus & stomach	7	0	7
Duodenum	3	0	3
Stomach & duodenum	3	0	3
No lesion	11	15	26

The distribution of lesions according to site in esophagus, stomach and duodenum and gender did not differ significantly ($p=0.0655$). There were total 11 males and 15 females among study group without any lesion as per UGI scopy.

Table 4: Association of upper GI scopy findings with fatigue, weight loss and prior IDA therapy and addictions

		Upper GI scopy		Total	p-value
		Normal	Abnormal		
Fatigue/lethargy	Yes	15	48	63	0.51
	No	11	26	37	
Weight loss	Yes	9	20	29	0.46
	No	17	54	71	
Prior IDA therapy	Yes	3	14	17	0.389
	No	23	60	83	
Addictions	Yes	2	12	14	0.28
	No	24	62	86	
Tobacco	Yes	2	3	5	0.464
	No	24	71	95	
Alcohol	Yes	1	9	10	0.22
	No	25	65	90	

We found no significant association in distribution of patients according to findings of upper GI scopy and history of fatigue, weight loss, prior IDA therapy. There was no association found between addiction and upper GI scopy results.

One patient had both the addictions of tobacco and alcohol consumption. Additionally, there was no association with tobacco and alcohol consumption with GI scopy findings.

Table 5: Association of upper GI scopy findings with lab parameters

	Upper GI scopy	Mean	SD	p-value
Hemoglobin	Normal	7.71	1.73	0.60
	Abnormal	7.49	1.88	
TLC count	Normal	7565.38	2830.82	0.51
	Abnormal	8148.65	4158.94	
Platelet count	Normal	259615.38	112821.66	0.38
	Abnormal	286540.54	139407.37	
MCV	Normal	70.53	8.93	0.58
	Abnormal	71.68	8.49	
Iron	Normal	21.32	10.04	0.16
	Abnormal	24.73	10.59	
TIBC	Normal	280.35	84.10	0.63
	Abnormal	287.45	55.48	

The mean values of these parameters were calculated according to normal or abnormal upper GI scopy findings and compared between the groups. The difference in the means of hemoglobin, TLC count, platelet count, MCV, level of iron and TIBC did not differ significantly between the groups with normal and abnormal upper GI scopy.

Table 6: Association between upper GI scopy and stool for occult blood

Stool for occult blood	Upper GI scopy		Total	Chi-Square Value	p-value
	Normal	Abnormal			
Negative	24	35	59	16.11	<0.001
Positive	2	39	41		
Total	26	74	100		

Out of 100 patients with iron deficiency anemia, stool for occult blood was positive in 41 patients and negative in 59 patients. Patients with stool occult blood positive had statistically significant (p <0.001) chances of having abnormal upper GI scopy finding.

Table 7: Endoscopic biopsy details

Biopsy finding	No. of cases (n)
Nonspecific duodenitis	4
Adenocarcinoma	2
Acute on chronic gastritis	2
Abetalipoproteinemia	1
Low grade neuroendocrine tumour	1
Normal	1

Most common biopsy finding was non-specific duodenitis followed by adenocarcinoma, acute on chronic gastritis.

Discussion

This study was conducted in a tertiary Hospital in western Maharashtra to assess upper GI scopy lesions in iron deficiency anemia patients. Data about GI lesions in IDA patients from this region of Western Maharashtra was lacking as most of the studies are done in other parts of this country and world.

The mean age of the patient was 50.58 ± 15.79 years, ranging from 18 to 87 years. The mean duration of symptom was 26.22 ± 34.46 days, ranging from 1 to 180 days. There were 59 (59%) males and 41 (41%) females in the present study.

In the current study, 63 of 100 patients reported symptom of fatigue or lethargy, 56% (n=56) patients had GI symptoms (nausea, vomiting, abdominal pain, hematemesis) and 29% (n=29) patient had history of weight loss. 17 out of 100 patients had the history of prior iron deficiency anemia therapy. According to Singh A et al.⁹, 69.1% of the subjects they enrolled reported having symptoms, with 66.4% having GI symptoms. According to Kumar A et al¹⁰, 91 percent of cases had main presenting complaint of weakness and easy fatiguability.

In present study the abnormal findings of GI scopy were reported in 74 cases (74%), of which 17 patients had lesion in esophagus (17%), 62 patients in stomach (62%) and 6 patient had duodenal lesion (6%). 3 patients had lesions in both stomach and duodenum, while 7 patients had lesion in both stomach and esophagus. Among abnormal findings, gastritis (43%) was the most common finding, followed by gastric ulcers (8%), esophageal varices (5%), GERD (4%), etc. The most frequent abnormal endoscopy finding in subjects with iron deficiency anaemia, according to Jain S¹¹, was erosive gastritis (26%), which was followed by fundal varix (5.33%), esophageal varices (4.66%), peptic ulceration (3.33%), and other conditions. The most frequent lesions seen during upper GI endoscopy, according to Singh A et al⁹, were antral gastritis (9.9 percent) and H. pylori gastritis (7.2 percent).

According to Majid S et al¹², the oesophagus (10.5%), stomach (22.1%), duodenum (8.5%), colon (10.5%), and oesophagus + colon (1.1%) were the sites of involvement of gastrointestinal tract in IDA patients. No site was involved in 47.4 percent of cases. Malignancies of the GI tract are more common in older men and women (postmenopausal) having IDA, with a prevalence of 10%–17%.

However, in our study malignancy was diagnosed in only 3% of cases (n=3).

In the present study, no significant difference in the distribution of patients was reported as per age, gender, duration of onset of disease, or symptoms reported between the groups with normal and abnormal upper GI scopy. The presence of occult blood in stools was significantly associated with the presence of GI lesions.

Limitations of our study were small sample size and single Centre study. Hence, would require further validation to generalize it to patients of whole region.

Conclusion

The assessment of upper GI scopy in IDA patients revealed that gastritis and gastric ulcer are the most common lesions found among IDA patients from western Maharashtra. Upper GI endoscopy should be done in severe IDA patients. Also stool for occult blood can be used as screening test in resource poor settings to predict upper GI lesions especially when Upper GI endoscopy is not available or too expensive for the patient.

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