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Original article

Study of upper gastrointestinal lesions on endoscopy in patients with severe anaemia

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Abstract

Introduction: Anaemia occurs in late stages of iron deficiency and thus, on estimation the prevalence of iron deficient state is 2.5 times more than iron deficiency anaemia (IDA). Chronic bleeding in the gastrointestinal tract is the leading cause of IDA in population above 50 years. Occult gastrointestinal bleeding is a common cause of IDA. Recent evidence suggests that most of patients with iron deficiency anaemia has a significant gastrointestinal tract pathological lesion.

Aim: To study the various gastrointestinal causes and lesions in patients with severe anemia due to iron deficiency without any GI symptoms with the help of upper GI endoscopy.

Materials & methods: A total of 60 subjects were taken from medical wards. Ethical approval was obtained from the institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Complete clinical and demographic details of all the patients were obtained. Blood samples were obtained and biochemical profile was recorded. All the patients underwent upper GI endoscopy.

Results: Maximum (26.7%) study subjects were in age group of 50-59yrs. A total of 56.7% subjects were females and 43.3% subjects were males. Tachycardia (56.7%) was the commonest sign. Faecal occult blood test was found to be positive in 34 cases out of 60 subjects (56.67%). 58.33% cases had GI lesions responsible for IDA and in 41.67% study subjects; no GI lesion responsible for IDA was detected on upper GI endoscopy. Among demographic variables age and faecal occult blood had statistically significant association with GI lesions responsible for IDA using Chi square test ($p<0.05$). UGIE findings among study subjects showed; Oesophagus, 60% patients had normal findings. Erosive esophagitis (20%) followed by varices (8.4%) were commonly found. Oesophageal mass lesions were found in 3.3% patients.

In stomach,53.3% patients had normal findings. Haemorrhagic erosive Gastritis (25%) was the common finding. Gastric ulcers were found in 6.7% cases, Portal Hypertensive Gastropathy in 5% cases and gastric mass lesions in 3.4% cases. In duodenum,70% patients had normal findings. Duodenal ulcer was present in 8.5% cases. On Univariate analysis, advancing age

(p = 0.011) and positive faecal occult blood (p = 0.001) were the factors significantly associated with presence of GI lesions responsible for IDA. On Multivariate logistic regression analysis after adjusting for confounding factors positive faecal occult blood test was the independent predictor of lesions responsible for iron deficiency anaemia on endoscopy, but the advancing age was not.

Conclusion: Iron deficiency is one of the common causes of anemia. In many cases of iron deficiency anemia, the cause of iron deficiency remains unexplained. Endoscopic lesions responsible for IDA were found in 35 out of 60 cases. More than half of the patients had positive faecal occult blood test. Stomach was the commonest site for GI lesions responsible for IDA followed by the oesophagus, duodenum. Advancing age and positive faecal occult blood test correlated with the presence of lesions on GI endoscopy responsible for IDA. Thus, to conclude, upper GI endoscopy is an important tool in the evaluation of unexplained iron deficiency anemia.

Key words: Endoscopy, Occult Blood, Gastritis, Peptic Ulcer, Stomach Neoplasms

Introduction:

More than half of the total anaemia cases (two billion) in the world are due to iron deficiency as per the World Health Organization (WHO).[1] Anaemia occurs in late stages of iron deficiency and thus, on estimation the prevalence of iron deficient state is 2.5 times more than iron deficiency anaemia (IDA).[2,3] Chronic bleeding in the gastrointestinal tract is the leading cause of IDA in population above 50 years. Occult gastrointestinal bleeding is a common cause of IDA. Recent evidence suggests that most of patients with iron deficiency anaemia has a significant gastrointestinal tract pathological lesion.[4] The evaluation of patients with unexplained iron deficiency anaemia and without any obvious bleeding should include the gastrointestinal tract. In population above 50 years, screening of the gastrointestinal tract is advised, regardless the presence of anaemia. The aim of the current study was to evaluate the gastrointestinal mucosa on upper GI endoscopy and search for a potential source of blood loss or iron malabsorption causing IDA in patients without obvious GI symptoms.

Materials & methods:

The study was conducted in tertiary care hospital of western Maharashtra, India. The study was conducted between July 2019 to July 2020. Total 100 patients admitted in the medical wards who were found to have iron deficiency anaemia. After initial investigations, the cause of iron deficiency remained unknown in 60 patients. Following were the inclusion criteria for the selection of study subjects- age ≥ 18 years, Hb ≤ 6 gm/dl, and iron studies showing serum iron concentration ≤ 45µg/dl, transferrin saturation ≤ 10%, serum total iron binding capacity of ≥ 400 µg/dl, serum ferritin concentration ≤ 20 ng/ml for men and ≤10 ng/ml for women. Patients with active source of blood loss (active GI loss, epistaxis, menorrhagia), chronic kidney disease, pregnancy, active malignancy, steroid and non-specific anti-inflammatory drug therapy 8 weeks prior to commencement of the study, bleeding and coagulation disorders were excluded from the study. 60 patients were included in the study after a written informed consent. The study was commenced after the approval from the institutional scientific and ethics committee. A detailed clinical history and general physical examination was done. Complete blood count, iron studies, stool occult blood, ultrasound abdomen and pelvis was done for all patients. All patients underwent upper GI endoscopy. Gross findings were noted. Biopsies were taken from esophagus (Lower 1/3rd), Stomach (Fundus, Body and Antrum), Duodenum 2nd part (D2) as and when required . Biopsy samples were sent for histo-pathological examination.

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Results:

Maximum (26.7%) study subjects were in age group of 50-59yrs followed by 23.3% in 60-69yrs and 20% in 40-49yrs. Mean age of study subjects were 54.86 ± 13.53years. A total of 56.7% subjects were females and 43.3% subjects were males. Male to Female ratio of the study subjects was 1:1.3. Pallor was present in all the patients. Sixty percent patients had generalized weakness and easy fatigability. Tachycardia (56.7%) was the commonest sign. Faecal occult blood test was found to be positive in 34 cases out of 60 subjects (56.67%).

The study subjects were divided into two groups, 58.33% cases had GI lesions responsible for IDA and in 41.67% study subjects; no GI lesion responsible for IDA was detected on upper GI endoscopy.

Table-1 Demographic and Biochemical factors in the study subjects according to the presence of GI lesions responsible for IDA

Parameters	GI lesions responsible for IDA found (Mean ± SD)	GI lesions responsible for IDA not found (Mean ± SD)	P Value
Age (years)	58.57 ± 11.68	49.68 ± 14.45	**0.011**
Haemoglobin(g/dl)	4.5 ± 1.8	4.8 ± 1.4	0.573
Total Leukocyte Count (/µL)	6562.9 ± 1671.6	7304.0 ± 1657.2	0.095
Red Blood Cell count (*10^6/µL)	3.5 ± 0.7	3.6 ± 0.6	0.579
Packed Cell Volume (%)	23.1 ± 5.8	24.6 ± 5.1	0.309
Mean Corpuscular Volume(fL)	65.5 ± 7.3	68.8 ± 4.7	0.051
Mean corpuscular haemoglobin (pgms)	21.3 ± 3.3	21.8 ± 2.3	0.473
Mean corpuscular haemoglobin concentration (g/dL)	32.6 ± 4.2	32.0 ± 3.9	0.548
Red cell Distribution Width (%)	19.8 ± 2.8	19.1 ± 2.7	0.33
Corrected Retic Count (%)	0.9 ± 0.5	1.0 ± 0.4	0.508
Faecal occult Blood positive(n)	30/5	4/21	**0.001**

Table 1, shows comparison of mean value of various iron study estimation parameters among the two study groups – 1. Those with GI lesions responsible for IDA and 2. Those with normal upper GI endoscopy or with GI lesions not

responsible for IDA. There was no statistically significant difference in mean value of biochemical parameters among two groups using T test ($p>0.05$). Among demographic variables age and faecal occult blood had statistically significant association with GI lesions responsible for IDA using Chi square test ($p<0.05$). Mean value of iron study parameter was compared using Student's T-test between two groups and there was no statistically significant difference in mean values of any of the Iron study parameters among both the groups ($p>0.05$). Abnormal abdominal ultrasound examination was found in 26.7% cases with the predominant findings being that of Hepatosplenomegaly.

Table - 2 Upper GI gross findings on endoscopy

Oesophagus	Gross Findings	Number of patients (n = 60)	Percentage (%)
	Normal	36	60
	Erosive Esophagitis	12	20
	Hiatus Hernia with erosions	3	5
	Oesophageal Varices	5	8.4
	Oesophageal mass lesion	2	3.3
	Oesophageal candidiasis	2	3.3
Stomach	Normal	32	53.3
	Haemorrhagic Antral/pan/erosive Gastritis	15	25
	Gastric Ulcer	4	6.66
	Portal Hypertensive Gastropathy	3	5
	Gastric varix	2	3.4
	Gastric Mass Lesion	2	3.4
	Gastric polyp	1	1.7
	Gastric Antral Vascular Ectasia	1	1.7
Duodenum(D1/ D2)	Normal	42	70
	Erosive Duodenitis	13	21.6
	Duodenal Ulcer	5	8.5

Table 2 shows UGIE findings among study subjects. In Oesophagus, 60% patients had normal findings. Erosive esophagitis (20%) followed by varices (8.4%) were commonly found. Oesophageal mass lesions were found in 3.3% patients.

In stomach,53.3% patients had normal findings. Haemorrhagic erosive Gastritis (25%) was the common finding. Gastric ulcers were found in 6.7% cases, Portal Hypertensive Gastropathy in 5% cases and gastric mass lesions in 3.4% cases.

In duodenum,70% patients had normal findings. Duodenal ulcer was present in 8.5% cases.

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Table-3 Histo-pathologically confirmed lesion in the GI tract responsible for IDA

	Number of patients (n = 60)	Percentage (%)
HPE oesophagus		
Normal	36	60
Lesions responsible for IDA		
a- Erosive oesophagitis	12	20
b- oesophagus squamous cell carcinoma	1	1.6
c- Oesophagus Adeno carcinoma	1	1.6
Lesions not responsible for IDA	5	8.3
HPE Stomach		
Normal	32	53.3
Lesions responsible for IDA		
a- Erosive gastritis	15	25
b- Adenocarcinoma stomach	2	3.3
Lesions not responsible for IDA	1	1.6
HPE duodenum		
Normal	42	70
Lesions responsible for IDA		
a- Erosive duodenitis	13	21.6
Lesions not responsible for IDA	0	0

Table 3, histopathological examination of the UGI samples proved the following: In the upper GI tract, 23.2% patients had oesophageal lesions responsible for IDA, 28.3% cases had stomach lesions responsible for IDA and 21.6% cases had duodenal lesions responsible for IDA.

In 33.33% cases, UGI biopsies were not sent because they had obvious gross findings like peptic ulcers and varices etc.

On Univariate analysis, advancing age ($p = 0.011$) and positive faecal occult blood ($p = 0.001$) were the factors significantly associated with presence of GI lesions responsible for IDA.

On Multivariate logistic regression analysis after adjusting for confounding factors positive faecal occult blood test (OR 25.48, 95% CI 4.52 – 143.71) was the independent predictor of lesions responsible for iron deficiency anaemia endoscopically, but the advancing age was not. (OR 1.65, 95% CI 0.37-7.2)

Discussion:

The current study showed that maximum (26.7%) number of study subjects were in the age group of 50-59 yrs followed by 23.3% in 60-69 yrs and 20% in 40-49 yrs. Mean age of study subjects were 54.47 ± 13.53 years and the age range of study subjects was 20 to 81 years. In a study by Serefhanoglu et al, the mean age of the cases was 43.3 years and the age range were 19 to 81 years which was similar to our study.[5] The study was done on 91 patients out of which 20 patients were below fifty years and 71 patients were above fifty years. In our study, there were 34 females (56.7%) and 26 males (43.3%). In a similar study, there were 77 females and 14 males. A total of 66 women were in the childbearing age and 11 were post-menopausal.[5] In the present study, out of 60 patients, in 35 (58.33%) patients the upper. GI endoscopy revealed the cause of IDA. In the current study, faecal occult blood was positive in total 34 cases, out of which GI lesion responsible for IDA were found in 30 cases (88.2%). The findings are consistent with the study by Majid et al. where 27 out of 30 patients (90%) with positive faecal occult blood had GI lesions responsible for IDA.[7] In the present study following were the gross UGIE findings: -

a) Oesophagus was grossly normal in 60% cases. Oesophagitis (20%) was the most common finding followed by Varices (8.4%) and hiatus hernia (5%). Oesophageal mass lesions were found in 3.3%.
b) In stomach, 53.3% patients had normal findings. Haemorrhagic erosive Gastritis (25%) was the common finding followed by gastric ulcers (6.7%), portal hypertensive gastropathy (5%) and gastric mass lesions (3.4%).
c) In duodenum, 70% patients had normal findings and 8.5% cases had duodenal ulcer. In UGIE, malignant GI lesions were detected in 4 out of 60 patients (6.7%). Out of 4 lesions 2 were in oesophagus and 2 were in stomach.

In a study by NIV et al, total 29% patients had lesion in the UGIE which were responsible for IDA, oesophagitis (14%) and erosive gastritis (14%) were the most common finding followed by erosive duodenitis (7%).[6]In a study by Majid et al, total 75% patients had lesion in the upper GI tract which were responsible for IDA, erosive gastritis (8.4%) followed by erosive oesophagitis (6.3%) were the common findings.[7] The findings are consistent with our study. Inflammatory, ulcerative and malignant GI lesions were the most common UGIE findings in our study. These findings were similar to the results of many studies where GI endoscopic evaluation was done for IDA.[6,8,9,10]In the present study, histopathological examination of the biopsy samples collected during UGIE showed the following results: - No abnormalities found in 60% and 53.3% and 70% biopsies from the oesophagus, stomach and the duodenum respectively. Abnormal findings were as follows: - erosive esophagitis (20%) followed by oesophageal adenocarcinoma (1.6%), oesophageal squamous cell carcinoma (1.6%), erosive gastritis (25%) followed by adenocarcinoma stomach (3.3%) and erosive duodenitis (21.6%). On univariate analysis, in the present study, age ($p = 0.011$) and a positive faecal occult blood test ($p = 0.001$) were the significant factors associated with lesions responsible for IDA. On multivariate logistic regression analysis after adjusting for confounding factors, faecal occult blood positive (OR 25.48, 95% CI 4.52 – 143.71) was independent predictor of lesions responsible iron deficiency anaemia on upper GI endoscopy. Age of the patients was not a predictor of IDA lesions in our study. Limitation of our study was selection and observer bias. To conclude, in this study we found that the age of the patients and a positive faecal occult blood test are the important factors that predict the presence of GI lesions

responsible for IDA. Inflammatory and haemorrhagic lesions of the GIT followed by bleeding peptic ulcer disease and oesophageal and gastric varices were the most common lesions responsible for IDA in our study. Investigations for anaemia should be tailored according to the patient's age and other biochemical parameters. Upper GI endoscopy is a very important investigation tool for finding the cause of iron deficiency in adults.

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