Original Article

The Frequency of Upper Gastrointestinal Tract Disorders Detected Upon Endoscopic Gastric/Duodenal Biopsies in Patients with Iron Deficiency Anemia

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Objective: To determine the frequency of various Upper Gastrointestinal Tract disorders detected on Endoscopic gastric/ duodenal biopsies in patients with Iron Deficiency Anemia.

Methods: Three hundred eighty four patients of both genders with a diagnosis of Iron Deficiency Anemia and Stool for Occult Blood positive were selected via Non- Probability Consecutive Sampling and were subject to Upper Gastrointestinal Endoscopy. 4 types of Upper GI disorders were identified from the histopathology of the biopsies specimen. SPSS version 20.0 was used for Statistical Analysis.

Results: Out of a total of 384 patients included in the study, 231 (60.15%) were between the age group of 20-30 years, 153 (39.84%) between 31-45 years. Mean+SD was calculated as 29.88+6.75 years, 109 (28.38%) were males and 275 (71.61%) were females. Frequency of upper gastrointestinal tract disorders in patients with iron deficiency anemia was recorded in 179 (46.61%) while 205 (53.38%) patients had no findings on Upper GI Endoscopy. Out of 179 cases, 53 (29.60%) had Erosive gastritis, 59 (33.51%) had gastric ulcer, 34 (18.99%) had Erosive duodenitis while 33 (18.43%) had Gastric malignancy.

Conclusions: The Frequency of Upper Gastrointestinal tract disorders in patients with iron deficiency anemia is high out of which Gastric ulcer followed by Erosive gastritis are the most common disorders, which may be avoided by controlling Iron Deficiency Anemia.

Keywords: Iron deficiency anemia, upper gastrointestinal tract disorders, etiologies, gastric ulcer, erosive gastritis and frequency

Introduction

The prevalence of anemia in the developing countries is quite high, with iron deficiency (hypochromic microcytic) anemia being the most common cause, attributed either to poor dietary intake or to conditions predisposing to chronic blood loss.[1] About 30% of the world's population is affected by iron deficiency anemia (IDA).[2] Although the prevalence of IDA is more in the neonates and young children, but it still remains common in the adults. In the United States, about 1-5% of males and 5-12% of non-pregnant females have IDA.[3] IDA can be diagnosed and the underlying identifiable causes corrected by carrying out conventional upper gastrointestinal endoscopy and colonoscopy.[4] But these procedures are not performed routinely in every patient with IDA. For asymptomatic patients, different investigations may be ordered. In the elderly, colonoscopy may be more conclusive but the convenience of upper GI endoscopy still makes it the primary investigation.[5] Despite the widespread use of these techniques for diagnosing the cause of IDA, these endoscopic procedures fail to ascertain any GI cause in about 20% of the patients during their hospital stay.[1]

Iron deficiency anemia is defined as a hemoglobin concentration <13.5 g/dl in males and <11.5 g/dl in females, a serum iron concentration < 10 μg/ml with a transferrin saturation ≤20%, mean corpuscular volume (MCV) <80 fL and a serum ferritin concentration ≤ 30 ng/ml. In a study conducted by Gordon SR et al,[6] a source in the upper gastrointestinal tract was found in 41% of the patients with iron deficiency. 15% of these patients had peptic ulcer disease while 7% had erosive gastritis. Shahid Maji, Mohammad Salih et al,[4] in another study identified upper gastrointestinal lesions in 41% of the patients, 8.4% of these patients had erosive gastritis, 5.3% had gastric ulcer and 5.23% had gastric malignancy.

In another study, frequency of upper gastrointestinal disorders was 66% of which, peptic ulcer was noted in 30 % and erosive gastritis in 18%.

This study was planned to determine the actual frequency of upper gastrointestinal tract disorders as results of previous studies are markedly variable e.g., Gordon SR conducted his study on patients above 50 years of age.[6] Moreover, the only available local study

Keeping in view the increased frequency of gastric disorders since 2008, this study was designed to demonstrate the occurrence of various gastrointestinal tract disorders in patients with Iron Deficiency Anemia.

Chronic erosive gastritis on Upper GI Endoscopy was visualized as small erythematous nodules with shallow central erosions. Histopathology revealed few polymorphonuclear leukocytes with predominant plasma cells in the inflammatory infiltrate. The endoscopic findings of Gastric ulcer showed an eroded base. On histopathology, it was noted as sharply demarcated, with normal gastric mucosa, falling away into a deep ulcer whose base contained inflammed, necrotic debris. Histopathology of a gastric malignancy revealed abnormal texture of the mucosa, and the presence of signet ring cells with loss of architecture. Erosive duodenitis was labelled by the presence of ulcers in epithelium and polymorphonuclear leukocytes on histopathology.

Methods

This Cross- Sectional Study was conducted in the Department of Medicine (South Medical Ward) of Mayo Hospital, Lahore from 10th August, 2016 to 9th February, 2017. The calculated sample size was approximately 384 patients with 2.5 % margin of error, 95% confidence level taking expected percentage of gastrointestinal disorders (gastric malignancy) as 5.23%. Non probability Consecutive sampling technique was used. Patients of either sex between the age of 20-45 years, with an established diagnosis of Iron Deficiency Anemia and symptoms of weakness, easy fatigability, palpitation and shortness of breath, leg cramps and pale skin and those in whom Stool for Occult Blood was positive were included in the study. However, Patients with history of previous gastric surgery, those with bleeding disorders or with history of bleeding per rectum established by per rectum examination or proctoscopy, those who refused colonoscopy, or patients on certain diets like beetroot, cauliflower, carrots, grape fruit, fish, red meat and poultry, turnips, multivitamins like Vitamin C and iron supplementation 48-72 hours before stool for occult blood was taken were excluded from the study. After taking permission from the Hospital Ethical Committee, three hundred eighty four patients fulfilling the inclusion criteria presenting to the Medical OPD of South Medical Ward, Mayo Hospital, Lahore and those who were admitted in the general medical wards of the hospital were included in the study. Demographic and medical history was taken from the patients and a complete physical examination was carried out. An informed consent was taken from the patients after explaining about Upper Gastrointestinal Endoscopy procedure and its possible benefits and risks. After appropriate preparation, Upper GI endoscopy of all patients was carried out by a Consultant Gastroenterologist. All the suspicious lesions were biopsied and sent to the Central Lab of Mayo Hospital, Lahore for histopathology. All the information including the results of biopsy was collected on a specially designed Proforma.The Statistical Software SPSS Version 20.0 was used to analyze the data. Quantitative variables like age was described as mean and standard deviation while qualitative variables like sex, upper GI disorders like erosive gastritis, gastric ulcer, gastric malignancy, and erosive duodenitis were described as frequency and percentage.

Results

Out of a total of 384 patients enrolled in the study, 231 (60.15%) were between 20-30 years of age and 153 (39.84%) were between 31-45 years of age. Mean$\pm$SD was calculated as 29.88$\pm$6.75 years. 109 (28.38%) of the enrolled patients were male and 275 (71.61%) were females. The Frequency of upper gastrointestinal tract disorders was recorded in 179 (46.61%) while 205 (53.38%) patients had no findings on Upper GI Endoscopy. Out of 179 patients with findings on Endoscopy, 53 (29.60%) had Erosive gastritis, 59 (33.51%) had gastric ulcer, 34 (18.99%) had Erosive duodenitis while 33 (18.43%) had a Gastric malignancy.

Table-1: Demographic characteristics of patients.

Age Distribution (Years)	Controls (n=100)
20-30	231 (60.15%)
31-45	153 (39.84%)
Mean± SD	29.88±6.75 years
Gender Distribution	
Males	109 (28.38%)
Females	275 (71.61%)
Frequency of upper GI tract disorders	
Present	179 (46.61%)
Absent	205 (53.38%)

Table-2: Frequency of various upper gastrointestinal tract disorders detected in patients with iron deficiency anemia (n=179).

Diorder	No of Patients	Percentage
Erosive gastritis	53	29.60
Gastric ulcer	59	33.51
Erosive duodenitis	34	18.99
Gastric malignancy	33	18.43

Table-3: Gender distribution of various upper gastrointestinal tract disorders.

Diorder	Gender		Total Patients	P-Value
	Male	Female		
Erosive gastritis	14	39	53	0.04
Gastric ulcer	18	41	59	0.04
Erosive duodenitis	07	27	34	0.04
Gastric malignancy	14	19	33	0.04

Discussion

The prevalence of anemia increases with age and is very common in the elderly population.[20,21] According to the criteria for anemia set by the World Health Organization i.e., hemoglobin <12g/dl in females and 13g/dl in males, about 8-44% of the elderly have anemia, with a prevalence in males in the age group of 85 years or more.[22] This does not imply that anemia occurs as an inevitable consequence of aging. In 80% of the elderly patients, a cause for anemia is found out of which iron deficiency and chronic disease are the most common causes.[23] Third National Health and Nutrition Examination Survey (NHANES III) conducted from 1988 to 1994 reported the presence of iron deficiency anemia in about 1-2% of the adults. Anemia without iron deficiency occurred in about 11% of premenopausal women and 4% of men. The older adults, according to this survey, had a higher prevalence of iron deficiency anemia, i.e., 12-17 % in the age group of 65 years and above.[8]

In the well developed affluent countries, either overt or occult blood loss, comprise a major cause of iron deficiency.[9] Overt blood loss is seen in menorrhagia, hemoptysis, gross hematuria, hematemesis, malena, severe traumatic bleeding etc. whereas less obvious causes include repeated voluntary blood donations,[10,11] when the amount of blood loss exceeds the amount transfused usually in the post-operative setting or repeated blood sampling for diagnosing a complicated medical condition. Certain additional factors that contribute to iron deficiency in females include underestimation of menometrorrhagia, blood loss occurring at the time of delivery, direct loss of iron to the fetus while pregnant and to the neonate during breastfeeding. On the other hand, it is very difficult to diagnose occult bleeding which usually occurs through the gastrointestinal tract.

In NHANES I study, conducted on 9024 participants, men and postmenopausal women with iron deficiency anemia had an increased risk of being diagnosed with a gastrointestinal malignancy within the subsequent two years i.e., relative risk versus non-iron deficient controls was 31, 95% CI 9-107).[12] In a report dealing with 148 consecutive patients with iron deficiency anemia, 18 patients (12 percent) were found to have a malignant tumor. Using multivariate analysis, the odds ratio for the presence of malignancy in a patient with a serum ferritin ≤10 mcg/L and an LDH >250 units/L, when compared with patients having a ferritin >10 and an LDH <250, was 74 (95% CI 7-776). Fireman Z, et al,[7] conducted endoscopic evaluation in patients with iron deficiency anemia and identified upper gastrointestinal lesions in 55.8% patients, out of which erosive gastritis was found in 27.9% and erosive duodenitis in 9.3%. In a study carried out by Annibale et al,[18] 85% of the patients with iron deficiency were found to have an underlying GI cause whereas Patterson RN et al[19] demonstrated that 34% of the patients with iron deficiency had GI lesions, out of which GI malignancy was found in about 10% whereas no gastrointestinal cause was found in 66% of the patients. The findings of this study are in agreement with Fireman Z et al, and other above stated studies. However, these findings are limited only to a small group of patients with Iron Deficiency Anemia, therefore, the results cannot be generalized. Large multi-centered studies on local population are required to validate the findings of this study.

Conclusion

The frequency of Upper Gastrointestinal tract disorders in patients with iron deficiency anemia is high, out of which Gastric ulcer followed by Erosive gastritis are the most common disorders. However, these may be avoided by controlling iron deficiency anemia.

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