Gastrointestinal Cancer: Research & Therapy

Open Access

Austin Publishing Group

Research Article

# Gastrointestinal Lesions in African American Patients with Iron Deficiency Anemia

**Brim B[1], Shahnazi A[2], Nouraie M[2], Badurdeen D[2], O Laiyemo A[2], Haidary T[2], Badurdeen D[2] and Ashktorab H[2]***

[1]Department of Medicine, Pathology and Cancer Center, Howard University College of Medicine, Washington DC, USA

[2]Department of Medicine and Cancer Center, Howard University College of Medicine, Washington DC, USA

***Corresponding author:** Hassan Ashktorab, Cancer Research Center and Department of Medicine, Howard University College of Medicine, 2041 Georgia Avenue, N.W., Washington, D.C. 20060, USA

**Received:** April 25, 2017; **Accepted:** May 19, 2017; **Published:** May 26, 2017

**Abstract**

**Background:** Iron deficiency anemia (IDA) is a frequent disorder that is associated with many serious diseases. However, the findings of an evaluation of IDA associated gastrointestinal disorders are lacking among African American patients.

**Aim:** To determine the most prevalent gastrointestinal lesions among African American patients with IDA especially in young men.

**Methods:** We reviewed medical records (n=422) of patients referred for evaluation of IDA from 2008 to 2012. IDA was diagnosed using clinical laboratory tests. The results of esophagogastroduodenoscopy (EGD), colonoscopy and pathology specimens along with demographic data were abstracted and analyzed using STATA.

**Results:** The mean age was 61.9 years, and 50.5% were female. 189 patients (45%) had gross GI bleeding. The most frequent diagnoses were gastritis (40%), benign colonic lesions (13%), esophagitis (9%), gastric ulcer (6%), and duodenitis (6%). By sex, duodenal benign tumors were significantly more represented among females: 4% vs 1% (p=0.05) while left colon malignancy was more prevalent among males: 3% vs 0.05% (p=0.05). Benign and malignant colonic lesions were significantly more present among older patients: 16% vs 6% (P=0.005) and 5% vs 0% (p=0.008), respectively. Colitis was more prevalent in younger patients (≤50): 11% vs 2% (p=0.001). In patients with gross lower GI bleeding, the top diagnoses were gastritis (25%), benign colon tumors (10%), and duodenitis (6%). Colon cancer was diagnosed among 15 patients and all these patients were older than 50 years of age.

**Conclusion:** This exploratory analysis of IDA associated GI lesions revealed that gastritis and colonic lesions are most common lesions found among African Americans with IDA with minimal age and sex differences. Colitis was found more in young patients while IDA was more associated with lower GI malignancies in older patients. Upper GI endoscopy might be required if colonoscopy is unrevealing of the cause of IDA.

**Keywords:** Iron Deficiency Anemia; GI lesions; EGD and Colonoscopy

## Abbreviations

IDA: Iron Deficiency Anemia; African American; GI: Gastrointestinal; EGD: Esophagogastroduodenoscopy

## Background

Iron Deficiency Anemia (IDA) definition is based on the lower limit of normal in adults: 13g/dL in men and 12g/dL in women according to the World Health Organization (WHO) criteria. The mean normal value of hemoglobin is dependent on age, gender, race, and altitude. Patients with IDA have physiologic levels of hemoglobin and hematocrit that are lower than the above mentioned range [1].

These commonly applied limits have changed, especially when race is taken into account since African-Americans have physiologic levels of hemoglobin and hematocrit that are lower than this range. Iron deficiency anemia (IDA) is a common disorder that is associated with many serious diseases, including malignancies particularly of the gastrointestinal tract. Occult or gross bleeding from gastrointestinal (GI) lesions is a common cause of IDA in men and postmenopausal women [2].

Iron deficiency anemia (IDA) occurs in 2-5% of adult men and postmenopausal women [3,4] in the developed world and is a commo [cause of referral to gastroenterologists [5-8], Mal absorption syndrome and Gastrointestinal (GI) blood loss from [colonic cancer, gastric cancer are the most important causes that need to be sought [5], In spite of invasive procedures such as bidirectional GI endoscopy, it is sometimes challenging to diagnose the probable gastrointestinal (GI) tract source of bleeding that ultimately leads to IDA [9]. Endoscopy reveals a source of IDA in 30-50% of cases. Endoscopic evaluation should not be done in women without predictive factors; abdominal symptoms, age > 50yrs, and Hb < 9g/dl. Conversely, these factors are strongly associated with a GI lesion [10,11].

GI lesions are common sources of Iron deficiency and GI evaluation is obligatory in the evaluation of this disease among men and women, young and old if the cause is not readily apparent [12],




**Citation:** Brim B, Shahnazi A, Nouraie M, Badurdeen D, O Laiyemo A, Haidary T, et al. Gastrointestinal Lesions in African American Patients with Iron Deficiency Anemia. Gastrointest Cancer Res Ther. 2017; 2(2): 1020.

**Table 1:** Distribution of different GI lesions in IDA by gender.

| GI Lesions | Female N=213(%) | Male N=209(%) | P value |
|---|---|---|---|
| Gross GI bleeding, no (%) | 83 (39) | 106 (51) | 0.001 |
| Esophagitis, no (%) | 16 (8) | 23 (11) | 0.2 |
| GU, no (%) | 14 (7) | 11 (5) | 0.5 |
| DU, no (%) | 4(2) | 4(2) | 0.9 |
| Gastritis, no (%) | 95 (45) | 76 (36) | 0.08 |
| Duodenitis, no (%) | 10 (5) | 17 (8) | 0.1 |
| Colitis, no (%) | 8 (4) | 11 (5) | 0.4 |
| Esophageal Benign Tumor, no (%) | 0 | 1 (0.5) | 0.5 |
| Stomach Benign Tumor, no (%) | 5 (2) | 4 (2) | 0.7 |
| Duodenum Benign Tumor, no (%) | 8 (4) | 2 (1 ) | 0.05 |
| Colon Benign Tumor, no (%) | 24 (11) | 30 (14) | 0.3 |
| Esophageal Malignant Tumor, no (%) | 0 | 2 (1) | 0.2 |
| Stomach Malignant Tumor, no (%) | 1 (0.5) | 2 (1) | 0.5 |
| Colon malignant tumor | 5 (2) | 10 (5) | 0.2 |
| Both side Colon Malignant Tumor | 3 (1) | 0 | 0.2 |
| Rt side Colon Malignant Tumor | 1 (0.5) | 4 (2) | 0.1 |
| Lt side Colon Malignant Tumor | 1 (0.5) | 6 (3) | 0.05 |

However, there is lack of data on the etiology of IDA among African Americans.

In this study, we evaluated GI disorders among African Americans with IDA to determine potential GI causes of iron depletion.

## Methods

### Patients

In this retrospective study, we reviewed 650 patients' medical records. From 2008 to 2012, referred for evaluation of IDA that was diagnosed using clinical laboratory tests based on hemoglobin, ferritin and iron saturation. Based on ICD9-code, we selected patients. Out, of, 650 patients who got endoscopy, 422 (65%) patients had GI pathology and 228 (35%) patients had a normal GI endoscopy. We focused on patients with GI pathology and evaluated them. GI bleeding definition was based on ICD-9 as well. Forty five percent of patients have gross GI bleeding and 55% of them without gross GI bleeding had occult GI bleeding and or without any occult bleeding. GI bleeding was defined as, hematochezia, melena, hematemesis.

Microcytic hypochromic anemia secondary to thalassemia, sideroblastic anemia and lead poisoning were excluded. GI lesions were diagnosed in a single-center of the hospital based on esophagogastroduodenoscopy (EGD), colonoscopy and pathology data. We evaluated GI lesions that were diagnosed by demographic characteristics of the patients.

Patients who had active symptoms were 220 (52%) and without active symptoms were 202 (48%). Patient with active GI symptoms had symptoms like as abdominal pain or dyspepsia, constipation and weight loss. One hundred eighty seven (44%) patients had upper GI symptoms and 33 (8%) patients had lower GI symptoms. We could not divide into 2 groups; symptomatic and asymptomatic patients because several asymptomatic patients had a history of GI bleeding and some symptoms in the past. Colonoscopy was done for patients with lower GI symptoms or positive FOBT. EGD was done for patients with upper GI symptoms. Asymptomatic patients with Iron deficiency Anemia except celiac patients got bidirectional endoscopy.

**Table 2:** Distribution of GI lesions distribution in IDA by age.

| GI Lesions | <50 N=123 | ≥50y N=299 | P value |
|---|---|---|---|
| GI bleeding | 39 (32) | 150 (50) | 0.001 |
| Esophagitis | 12 (10) | 27 (9) | 0.8 |
| GU | 5 (4) | 20 (7) | 0.3 |
| DU | 0 | 8 (3) | 0.1 |
| Gastritis | 55 (45) | 116 (39) | 0.2 |
| Duodenitis | 9 (7) | 18 (6) | 0.6 |
| Colitis | 13 (11) | 6 (2) | <0.001 |
| Esophageal Benign Tumor | 0 | 1 (0.3) | 0.5 |
| Stomach Benign Tumor | 2 (2) | 7 (2) | 0.6 |
| Duodenum Benign Tumor | 1 (1) | 9 (3 ) | 0.3 |
| Colon Benign Tumor | 7 (6) | 47 (16) | 0.005 |
| Esophageal Malignant Tumor | 0 | 2 (1) | 0.4 |
| Stomach Malignant Tumor | 1 (1) | 2 (1) | 0.8 |
| Colon malignant tumor | 0 | 15 (5) | 0.008 |
| Both side Colon Malignant Tumor | 0 | 5 (2) | 0.6 |
| Rt side Colon Malignant Tumor | 0 | 5 (2) | 0.3 |
| Lt side Colon Malignant Tumor | 0 | 7 (2) | 0.1 |

Our study was done in African Americans and in our study just we had 2 cases of celiac that was excluded. H. Pylori test was positive in 17 (4%) patients. The study was approved by Howard University Institutional Review Board (IRB).

### Statistical analysis

Association of GI lesions in IDA patients with gender and age groups were assessed by Fisher's exact test. We also built logistic regression models to predict the GI lesion in IDA patients if applicable. All analyses were performed by STATA 13.0 (Stata Corp., College Station, TX).

## Results

The median (interquartile range) age was 58 (48-71) years with 50% female patients in the study group. Gross GI bleeding was observed in 189 patients (45%) while 233 patients (55%) had occult GI bleeding. In the overall analyzed group, the most frequent diagnoses based on endoscopy and histopathology were gastritis (40%), benign colonic lesions (13%), esophagitis (9%), gastric ulcer (6%), and duodenitis (6%). There were 3 stomach cancers, 2 esophageal cancers and 15 colorectal cancers. Except for GI bleeding, which was significantly more frequent in male (P = 0.001), the frequency of other lesions wasn't significantly different between the two genders (Table 1).

Among all patients with IDA, 299 (71% were 50 years or older, including 77% of male and 65% females (P = 0.006). In patients ≥50 years old, the frequency of GI bleeding, colon benign and colon malignant tumor was significantly higher while the frequency of colitis was significantly lower compared to younger age group (Table 2).

In a multivariate analysis, older age (OR= 2.1, 95%CI: 1.3-3.2) and male gender (OR= 1.5, 95%CI: 1.1-2.2) were associated with a higher rate of GI bleeding diagnosis.

## Discussion

Many patients with undetermined causes of IDA and lacking any gastrointestinal disease symptoms pose a challenge for their treatment, as long as the IDA-causing disorder is not elucidated. In this study, we found that gastritis and colonic lesions are the most common GI lesions found among African Americans evaluated for IDA. Some gender and age related differences were observed. Benign and malignant colonic lesions were significantly more present among older patients and colitis was more prevalent in younger patients. Duodenal benign tumors were significantly more represented among females while colon malignancy was more prevalent among males.

Occult GI bleeding was found in 55 % of patients. The frequency of gastritis and esophagitis without gross GI bleeding were more than gastric ulcer and duodenal ulcer. Since H. Pylori-associated gastritis and autoimmune atrophic gastritis can cause malabsorption, so more etiology investigation and studies are required to evaluate occult GI bleeding in the context of GI disorders.

The prevalence of benign and malignant colorectal tumors (13% and 3%, respectively) was similar to other studies [10]. Furthermore the frequency of inflammatory GI lesions such as gastritis and esophagitis was more prevalent than GI ulcers and tumor lesions. In addition, GI lesions as a source of IDA were more frequently located in the upper GI tract than in the colon, a finding in agreement with previously reported studies [13-17].

Although, the leading cause of IDA in men older than 50 and postmenopausal women is chronic gastrointestinal (GI) bleeding of GI lesions, the evaluation of the GI tract in younger men should also be considered seriously [18,19]. In our study, among young men with IDA, gastritis and colitis are the leading findings and there is a paucity of data in the literature regarding the etiology of IDA among young men. Our study suggests that inflammatory processes may contribute to IDA in younger patients [20]. In contrast, elderly patients in our study revealed a prevalence of malignancies' association with IDA. Indeed, a high rate of colon malignancies, predominantly right-sided colon carcinoma in post-menopausal women and older men with asymptomatic IDA has been reported [21]. Our results also show the benign and malignant colon Cancer can be one of the important etiology of IDA and this is consistent with other studies [22].

Because GI lesions leading to IDA are more frequently found in the upper GI tract than in the colon, Esophagogastroduodenoscopy (EGD) resulted in a better yield than lower GI endoscopy and was the most recommended procedure, except for elderly patients and/or those with specific symptoms such as abdominal pain or constipation who are more prone to lower GI tract lesions. In most patients, bidirectional endoscopy was required except for patients in whom the malignant lesions were detected through the initial endoscopy [23].

Because of the gastrointestinal malignancy risk, iron deficiency anemia requires extensive investigation. If no other sources of blood loss are apparent, the gastrointestinal tract is examined to detect sources of occult blood loss. Sometimes, small bowel series or capsule endoscopy is required for diagnosis of IDA with unknown GI source. Van Mook et al.Mentioned that in the absence of gastrointestinal symptoms, the colon should be examined first, especially in the elderly [24]. According to some studies like Van Mook, et al, upper gastrointestinal malignancy will probably be an infrequent finding and EGD should always be performed in patients with iron deficiency anemia after a negative colonoscopy. The presence of a significant, treatable lesion is most likely in the elderly and in those with a history of NSAID or ASA use. Routine duodenal biopsies should be performed to further increase the outcome of EGD to evaluate for malabsorption [24].

In our study, we found Gastritis and Colitis more associated with IDA in young patients and our recommendation was considering Upper GI endoscopy if colonoscopy is normal in the evaluation of IDA especially in young patients. In our study, Gastritis was more than peptic ulcer. Celiac disease was rare. We had just 2 celiac disease (0.004%) that was less than the average celiac disease prevalence in other populations.

## Conclusion

This exploratory analysis of IDA associated GI lesions revealed that gastritis and colonic lesions are most common lesions found among African Americans with IDA with minimal age and sex differences. Colitis was found more in young patients while IDA was more associated with lower GI malignancies in older patients. Upper GI endoscopy might be required if colonoscopy is unrevealing of the cause of IDA.

### References


1. Endres HG, Wedding U, Pittrow D, Thiem U, Trampisch HJ, Diehm C. Prevalence of anemia in elderly patients in primary care: impact on 5-year mortality risk and differences between men and women. Current medical research and opinion. 2009; 25: 1143-1158.
2. Khadem G, Scott IA, Klein K. Evaluation of iron deficiency anaemia in tertiary hospital settings: room for improvement? Internal medicine journal. 2012; 42: 658-664.
3. Kepczyk T, Kadakia SC. Prospective evaluation of gastrointestinal tract in patients with iron-deficiency anemia. Digestive diseases and sciences. 1995; 40: 1283-1289.
4. Cook IJ, Pavli P, Riley JW, Goulston KJ, Dent OF. Gastrointestinal investigation of iron deficiency anaemia. Br Med J (Clin Res Ed). 1986; 292: 1380-1382.
5. Goddard AF, James MW, McIntyre AS, Scott BB. Guidelines for the management of iron deficiency anaemia. Gut. 2011; 60: 1309-1316.
6. McIntyre AS, Long RG. Prospective survey of investigations in outpatients referred with iron deficiency anaemia. Gut. 1993; 34: 1102-1107.
7. Calvey HD, Castleden CM. Gastrointestinal investigations for anaemia in the elderly: a prospective study. Age and ageing. 1987; 16: 399-404.
8. Sayer JM, Long RG. A perspective on iron deficiency anaemia. Gut. 1993; 34: 1297-1299.
9. Napal JJ, Hernandez JL, Alonso J, Casuso E. Differential factors of tumor etiology for iron deficiency anemia of probable gastrointestinal origin. Revista clinica espanola. 2009; 209: 265-269.
10. Nahon S, Lahmek P, Lesgourgues B, Nahon-Uzan K, Tuszynski T, Traissac L, et al. Predictive factors of GI lesions in 241 women with iron deficiency anemia. The American journal of gastroenterology. 2002; 97: 590-593.
11. Goddard AF, McIntyre AS, Scott BB. Guidelines for the management of iron deficiency anaemia. British Society of Gastroenterology. Gut. 2000; 46: IV1-IV5.

12. Carter D, Levi G, Tzur D, Novis B, Avidan B. Prevalence and predictive factors for gastrointestinal pathology in young men evaluated for iron deficiency anemia. Digestive diseases and sciences. 2013; 58: 1299-1305.

13. Reyes Lopez A, Gomez Camacho F, Galvez Calderon C, Mino Fugarolas G. Iron-deficiency anemia due to chronic gastrointestinal bleeding. Revista espanola de enfermedades digestivas: organo oficial de la Sociedad Espanola de Patologia Digestiva. 1999; 91: 345-358.

14. St John DJ, Young GP, Alexeyeff MA, Deacon MC, Cuthbertson AM, Macrae FA, et al. Evaluation of new occult blood tests for detection of colorectal neoplasia. Gastroenterology. 1993; 104: 1661-1668.

15. Allison JE, Tekawa IS, Ransom LJ, Adrain AL. A comparison of fecal occult-blood tests for colorectal-cancer screening. The New England journal of medicine. 1996; 334: 155-159.

16. Allison JE, Feldman R, Tekawa IS. Hemoccult screening in detecting colorectal neoplasm: sensitivity, specificity, and predictive value. Long-term follow-up in a large group practice setting. Annals of internal medicine. 1990; 112: 328-333.

17. Rockey DC, Koch J, Cello JP, Sanders LL, McQuaid K. Relative frequency of upper gastrointestinal and colonic lesions in patients with positive fecal occult-blood tests. The New England journal of medicine. 1998; 339: 153-159.

18. Rockey DC. Occult gastrointestinal bleeding. The New England journal of medicine. 1999; 341: 38-46.

19. Andrews NC. Disorders of iron metabolism. The New England journal of medicine. 1999; 341: 1986-1995.

20. Danese S, Hoffman C, Vel S, Greco M, Szabo H, Wilson B, et al. Anaemia from a patient perspective in inflammatory bowel disease: results from the European Federation of Crohn's and Ulcerative Colitis Association's online survey. European journal of gastroenterology & hepatology. 2014; 26: 1385-1391.

21. Niv E, Elis A, Zissin R, Naftali T, Novis B, Lishner M. Iron deficiency anemia in patients without gastrointestinal symptoms--a prospective study. Family practice. 2005; 22: 58-61.

22. Pengelly S, Fabricius M, McMenamin D, Wu E, Metzner M, Lewis SJ, et al. Attendance at iron deficiency anaemia clinic: audit of outcomes 5 years on. Colorectal disease: the official journal of the Association of Coloproctology of Great Britain and Ireland. 2013; 15: 423-427.

23. Pongprasobchai S, Sriprayoon T, Manatsathit S. Prospective evaluation of gastrointestinal lesions by bidirectional endoscopy in patients with iron deficiency anemia. Journal of the Medical Association of Thailand = Chotmaihet thangphaet. 2011; 94: 1321-1326.

24. van Mook WN, Bourass-Bremers IH, Bos LP, Verhoeven HM, Engels LG. The outcome of esophagogastroduodenoscopy (EGD) in asymptomatic outpatients with iron deficiency anemia after a negative colonoscopy. European journal of internal medicine. 2001; 12: 122-126.

Gastrointest Cancer Res Ther - Volume 2 Issue 2 - 2017
**Submit your Manuscript** | www.austinpublishinggroup.com


**Citation:** Brim B, Shahnazi A, Nouraie M, Badurdeen D, O Laiyemo A, Haidary T, et al. Gastrointestinal Lesions in African American Patients with Iron Deficiency Anemia. Gastrointest Cancer Res Ther. 2017; 2(2): 1020.