



## Original Article

## Evaluation of iron deficiency anaemia for gastrointestinal causes in patients without GI symptoms in high prevalent GI malignancy zones



Showkat A. Kadla<sup>a</sup>, Nisar A. Shah<sup>b,\*</sup>, Muzafar A. Bindroo<sup>b</sup>, Bilal A. Khan<sup>a</sup>, Adil Farooq<sup>c</sup>, Wajeed Yousef<sup>c</sup>, Bilal A. Wani<sup>c</sup>

<sup>a</sup> Department of Gastroenterology, GMC, Srinagar, J&K, India

<sup>b</sup> Department of Medicine and Gastroenterology, GMC, Srinagar, J&K, India

<sup>c</sup> Department of Medicine, GMC, Srinagar, J&K, India

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## ABSTRACT

**Background and study aims:** Gastric cancer is highly prevalent in Kashmir, as are lower gastrointestinal (LGI) malignancies. Colonic cancer, gastric cancer, and coeliac disease are the most important gastrointestinal (GI) causes of iron deficiency anaemia (IDA) worldwide. Approximately 9% of patients with IDA present with a suspicious lesion in the GI tract upon examination. However, the absence of GI symptoms and a possible lesion accounting for blood loss in IDA have not been studied in this zone with a high prevalence of GI malignancy. We aimed to examine IDA patients without GI symptoms to determine the most plausible cause of their blood loss.

**Patients and methods:** A total of 100 patients with IDA and 250 control subjects without IDA and referred for gastrointestinal endoscopy were enrolled in a cross-sectional, comparative study. Patients presenting with a significant lesion proportionate to their anaemia in the upper GI tract were not examined further, if no further strong indications were present.

**Results:** Twenty-nine patients (29%) were found to have malignancy: 13 with gastric cancer and 16 with colonic malignancies. Other apparent causes of GI blood loss included peptic ulcer disease in 10 (10%) patients, haemorrhoids in 22 (25%), polyps in eight (three in the upper GI tract and five in the LGI tract), gastric erosions in eight (8%), and angiodysplasia, diverticulitis, and trichuriasis in two (2%) each.

**Conclusion:** In light of the high incidence of GI malignancies in this patient group, a low threshold for GI screening as well as mass screening for IDA is needed.

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## Introduction

The most common cause of hypochromic microcytic anaemia worldwide is iron deficiency anaemia (IDA) [1]. In males and postmenopausal females, iron deficiency occurs due to chronic blood loss from the gastrointestinal (GI) tract [2,3]. Iron deficiency is identified by abnormal iron levels in addition to low haemoglobin (Hb) levels [4]. In the developed world, iron deficiency occurs in 2–5% of adult males and postmenopausal females [5]. It is a leading cause of patient referral to gastroenterologists [6,2]. Asymptomatic colonic and gastric carcinoma may present with IDA; thus, identifying these conditions is crucial in patients with IDA. Management of IDA is often suboptimal, as most patients are either incompletely

investigated or not investigated at all [7]. The causes of IDA are related to either low intake, malabsorption of iron, or blood loss. After confirmation with laboratory tests, GI evaluation is usually indicated to exclude GI malignancies. There is little consensus about the level of anaemia that requires investigation. The National Institute of Health and Clinical Excellence referral guidelines for suspected lower gastrointestinal (LGI) malignancy recommend that only patients with Hb concentration <11 g/dl in males and <10 g/dl in non-menstruating females be referred [8]. With these cutoff values, patients with colorectal cancer, especially men, are likely to be missed [9]. Thus, it is recommended that any level of anaemia be investigated in the presence of iron deficiency. Furthermore, men with Hb concentration <12 g/dl and postmenopausal females with Hb concentration <10 g/dl should be investigated more urgently, as lower levels of Hb indicate a more serious disease [9]. We aimed to examine adult patients with iron deficiency but no GI symptoms so as to determine the most plausible cause of IDA.

\* Corresponding author.

E-mail addresses: [drskadla@gmail.com](mailto:drskadla@gmail.com) (S.A. Kadla), [nisarshah19@gmail.com](mailto:nisarshah19@gmail.com) (N.A. Shah), [bindromuzafar@gmail.com](mailto:bindromuzafar@gmail.com) (M.A. Bindroo), [gastrobilal@hotmail.com](mailto:gastrobilal@hotmail.com) (B.A. Khan).

## Patients and methods

The study was conducted in the Division of Gastroenterology, Department of Medicine, Government Medical College, Srinagar, Kashmir. This was a cross-sectional, comparative, observational study conducted over a period of 2 years starting from January 2010. With the approval of the institutional ethics committee, this study was carried out with the aim of determining the “most common lesion likely to contribute to iron deficiency anaemia.” This study included 100 patients and 250 control subjects. Only adults above the age of 15 were included in the study. All patients were admitted for complete evaluation.

### Inclusion criteria

Patients presenting with symptoms of anaemia without GI symptoms, PBF (Peripheral blood film), and iron indices suggestive of hypochromic, microcytic anaemia with Hb levels <13 g/dl in males and <12 g/dl in females.

### Exclusion criteria

The purpose of the study and evaluation was explained to both patients and control subjects, and those not willing to participate were excluded from the study. The other exclusion criteria included patients below the age of 15, those with known malignancy, those receiving treatment known to cause bone marrow suppression, those with known bleeding disorders, those with haemolytic disorders, those who are/were prescribed radiotherapy protocols for some other disease, visible bleeding from any site, and those with chronic disease.

### Control subjects

Control subjects included 250 patients who underwent upper gastrointestinal (UGI) and LGI endoscopy for indications other than IDA. They included patients presenting with dysmotility, dyspepsia, and other GI symptoms without any features of IDA; thus, they were termed as the controls. They were matched equally in all respects with the patients.

After selection and provision of informed consent, both patients and controls were asked to provide a detailed medical history and were clinically examined. Only a detailed haemogram was performed for the controls. The patients were investigated with the following tests:

- A detailed haemogram including red blood cell (RBC) indices and reticulocyte count using a systemic Sysmex Automated Hematology Analyser KK-21, kidney function test (KFT) and liver function test (LFT) using a Hitachi Boehringer Mannheim's 912 Autoanalyzer, testing for hepatitis B (HBsAg by enzyme-linked immunosorbent assay (ELISA) using a J Mitras Hpealisa Kit) and Anti-hepatitis C virus antibodies (Anti-HCV) (Adaltis Italia Spa EIGN), and iron profile (AXSYM-ABOTT-USA for ferritin and DIMENSIONS-AR for serum iron, total iron-binding capacity (TIBC), and transferrin saturation) were performed.
- Based on the results of the above tests, patients with severe anaemia received corresponding therapy before any invasive procedure. Then they were subjected to UGI and LGI endoscopic studies using a Fujinon-EG-265WR and FUJINON-EC 201WL, respectively.
- For statistical analysis, data were fed to the computer using Statistical Package for Social Sciences (SPSS) Version-17. The chi-squared and *P*-values were obtained. A “*P*” value of <0.05 was considered statistically significant.

## Results

The majority of the participants (patients as well as controls) were males (65.60%). Sixty-six percent of patients and 66.4% of controls were from rural areas. The majority of patients were between the ages of 35 and 65 years (65% and only 13% were below the age of 35) (Table 1). Almost all patients presented with symptoms of anaemia, with three patients suffering congestive cardiac failure (CCF). The majority of controls who underwent UGI endoscopy presented with dyspepsia (88%), and their clinical examination findings were normal. The majority of controls undergoing colonoscopy showed altered bowel habits (36%) and chronic constipation (32%), whilst others had diarrhoea, abdominal distension, vague feeling of a lump, and postprandial distension with normal findings upon clinical examination.

All patients were found to be anaemic (Table 2). Sixty percent of patients had severe anaemia (Hb <8 g/dl). Only 6% had Hb levels below 5 g/dl, and 12% had Hb levels above 9.5 g/dl. Ninety percent of patients showed microcytic cells in their peripheral blood films (PBFs). Of the patients, 71% had a mean corpuscular volume (MCV) of <71. Almost 90% of patients were hypochromic. Severe hypochromia (MCH <22.50) was seen in 59% of patients. The mean corpuscular haemoglobin concentration (MCHC) was abnormal in 75% of patients. Almost all patients were confirmed with IDA based on the PBF findings.

Around 62% of patients had serum iron values of <8.0 µmol/l (Table 3). However, 8% of patients were found to have normal serum iron values. Approximately 88% of patients had increased TIBC value (>70). Amongst them, 33% had values >90. Approximately 16% had normal serum ferritin levels, whereas 44% had markedly low serum ferritin levels (<10). The transferrin saturation findings were abnormal at around 95%. The iron profile results were normal in few patients, due to the intake of iron and folic acid before investigations.

All the patients underwent UGI endoscopy; only 88 underwent LGI examination, as patients with significant lesions in the UGI tract were not subjected to LGI evaluation. One patient found to have a lower abdominal lump on clinical examination underwent colonoscopy despite being diagnosed with stomach cancer based on the oesophagogastroduodenoscopy (EGD) findings. This patient was found to have dual malignancy.

### UGI findings (Table 4)

The oesophagus appeared normal in the majority of patients (97%). The stomach showed the maximum number of lesions (31%), and malignancy was the most common finding (13%). A combination of ulcer in 5% of patients and erosive gastritis contributed to 11% of lesions. In the duodenum, ulcer was the most common finding (5%).

**Table 1**  
Age distribution amongst patients (*n* = 100) and controls (*n* = 250).

Age in years	Cases		Controls	
	No.	% Age	No.	% Age
15–25	05	05.00	20	08.00
26–35	08	08.00	29	11.60
36–45	18	18.00	51	20.40
46–55	13	13.00	47	18.80
56–65	34	34.00	72	28.80
66–75	18	18.00	29	11.60
76–85	02	02.00	02	00.80
86–95	02	02.00	00	00.00
Total	100	100.00	250	100.00

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