



ORIGINAL ARTICLE

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Retrospective evaluation of endoscopies of male and postmenopausal female patients with iron deficiency

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Abstract

Iron deficiency anaemia (IDA) is the most common type of anaemia, and its frequency and causes vary according to patient populations. Considering IDA as being an important mortality and morbidity cause, understanding IDA influence on several pathologies is quite necessary. In our study, we investigated gastrointestinal (GIS) pathologies that may lead to IDA in male and postmenopausal female patients. In our study, the data of 234 patients who underwent endoscopy in our hospital due to IDA between 01.01.2016 - 31.12.2017 were analyzed retrospectively. Of the patients participating in the study, 126 were male and 108 were female, and the mean age of the patients was 64.17. Esophagogastroduodenoscopy (EGD) was performed in 86.7% of the patients, colonoscopy in 44.4%, and both in 31.2%. Lesion detection was 96% in EGD, 56% in colonoscopy, and 97.3% in patients with both. The most common lesions in patients who underwent EGD were non-erosive gastritis, erosive gastritis, and bulboduodenitis. After the biopsy was performed, *Helicobacter pylori* positivity was found in 35.4%, gastric atrophy in 13.3%, and Celiac disease in 1.4%. The most common lesions in patients who underwent colonoscopy were polyps, hemorrhoids and diverticulum. In general, it was seen that the polyps were less than 3 cm in number and less than 1 cm in size. The incidence of inflammatory bowel disease was 5.8%, and ulcerative colitis was more common. In the upper GIS scan, malignancy was 5.1% and gastric adenocarcinoma was 3.6%. The rate of colorectal malignancy, more frequently in the left colon, was determined as 2.9%. In our study, it was observed that IDA patients were frequently accompanied by lesions originating from the GIS system. Considering the variety and complications of lesions in patients with IDA, upper and lower GIS endoscopies should be performed together and without delay.

Keywords: Colonoscopy, esophagogastroduodenoscopy, gastrointestinal system, iron deficiency anaemia

Introduction

According to the definition of the World Health Organization (WHO), anaemia is defined as a haemoglobin (Hb) level below 13 g/dl in adult men, below 12 g/dl in adult women, and below 11 g/dl in pregnant women [1]. Iron deficiency is defined as a decrease in the body's total iron. The development of anaemia because of iron deficiency reducing erythropoiesis is called iron deficiency anaemia (IDA) [1,2]. When there is a negative iron balance in the body (chronic blood loss, increased need for iron, absorption

disorder), Hb synthesis is made by mobilizing iron from the stores, and when there is not enough iron, IDA develops [3]. IDA is characterized by a decrease in serum iron and serum ferritin levels, an increase in total iron-binding capacity, and a decrease in transferrin saturation below 15% [3,4].

According to the data of WHO, anaemia is present in 24.8% of the world population, 12.7% of men and 23.9% of older adults [4]. In a prevalence study conducted in Turkey, anaemia was found to be 32% and IDH was 13% [5]. In developed countries, this rate is between 2% and 5%. Although the frequency of etiological causes of IDA varies according to age groups, nutrition in children, menstrual loss in women of childbearing age, and gastrointestinal system (GIS) diseases in older ages come to the fore [5,6]. GIS pathologies are the most common cause of iron deficiency in male and postmenopausal female patients [6]. Therefore, if there is IDA in this patient population, screening of the GIS is of great importance and studies on this subject in Turkey are quite limited.

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In this study, we analyzed endoscopic findings in male and postmenopausal female patients with IDA.

Materials and Methods

Ethical approval

This study was carried out in Bolu Abant Izzet Baysal University Faculty of Medicine Training and Research Hospital, Department of Internal Medicine and approval was obtained from the Ethics Committee of Bolu Abant Izzet Baysal University Faculty of Medicine (no:171).

Data collection

In our study, laboratory and endoscopy data of male and postmenopausal female patients (esophagus, stomach, bulb, duodenum findings in gastroscopy; terminal ileum, caecum, ascending colon, transverse colon, descending colon, rectum, anal canal findings in colonoscopy) who were referred to the Endoscopy Unit of the Department of Internal Medicine Gastroenterology with a preliminary diagnosis of IDA between 01.01.2016 and 31.12.2017 were collected retrospectively through the hospital database. A total of 234 patients, 108 women and 126 men were included in our study. The inclusion criteria were as follows; postmenopausal women, men were over 18 years old, Hb values <13 g/dl in men and <12 g/dl in women, iron parameters compatible with iron deficiency, and exclusion of other causes of anaemia.

Diagnosis

Laboratory values compatible with IDA were as follows; Hb values <13 g/dl in men and <12 g/dl in women, low serum iron level (<30 µg/dl), low transferrin saturation (<10-15%), low ferritin level (<15 µg/l), and low MCV level (<80 fl).

Statistical evaluations

IDA parameters (iron, iron-binding capacity, ferritin, haemoglobin, MCV) of the patients were recorded. IBM SPSS Statistics SPSS 20 (SPSS 20.0 for Windows, IBM, Chicago, USA) program was used for statistical analysis. For descriptive statistical data, the number of patients, age, average of laboratory values, number of lesions, and percentage of lesions were analyzed.

Results

General findings

The mean age of all patients was 64.0, the mean age of male patients was 62.22, and the mean age of female patients was 66.11. The mean Hb value among all patients was 10.82, 10.98 in male patients and 10.66 in female patients. The mean of ferritin was 30.86 in all patients, 33.71 in male patients and 28.02 in female patients (Table 1).

Gastritis was seen in 156 of 203 patients who underwent upper GIS endoscopy. It was observed that the most common type of gastritis was superficial, and the most common type of involvement was pangastritis (Table 2).

Of the patients who underwent esophagogastroduodenoscopy

(EGD), 44 (21%) had erosive gastritis, 23 (11%) gastric ulcer, 12 (5.9%) bulboduodenal ulcer, and 26 (12.8%) bulboduodenitis were detected. Atrophy was detected in 21 patients (10.3%), intestinal metaplasia in 5 patients (2.5%), and polyps in 15 patients (7.3%). 14 of the patients (6.9%) had gastrectomy. Esophagitis was observed in 10 patients (4.9%), esophageal varices in 5 patients (2.5%), esophageal mass in 1 patient (0.5%), and gastric vascular ectasia in 1 patient (0.4%) (Table 3).

Biopsy was performed in 195 of 203 patients who underwent EGD. Of these patients, 144 (73.8%) had gastritis, 59 (26.6%) intestinal metaplasia, 79 (40.5%) reactive gastropathy, 72 (37.0%) *Helicobacter pylori* (HP). Benign polyps were detected in 15 patients (7.3%), adenocarcinoma in 7 patients (3.5%), Celiac disease (CD) in 3 patients (1.5%), lymphoma in 1 patient (0.5%), and gastrointestinal stromal tumor in 1 patient (0.5%). The number of patients who underwent both EGD and colonoscopy was 73 (31.2%). Any lesion was detected in 195 (96.0%) patients who underwent EGD, 61 (58.6%) patients who underwent colonoscopy and 71 (97.2%) patients who underwent both EGD and colonoscopy. Colonoscopy was performed in 104 patients. Besides, the most common lesions were polyps (29.8% in 31 patients), hemorrhoids (19.2% in 20 patients), and diverticulum (10.6% in 11 patients) (Table 4).

Table 1. Demographic characteristics and laboratory values

	Male	Female	Total
Age	62.2±13.6	66.1±8.9	64.0±11.8
Iron	16	38.65	35.43
TIBC*	453	387.33	387.24
TS** (%)	8.35	9.34	8.84
Ferritin	33.71	28.02	30.86
Haemoglobin	10.98	10.66	10.82
MCV	78.32	81.10	79.71

TIBC*: Total iron-binding capacity, TS**: Transferrin saturation

Table 2. Characteristics of gastritis

Involvement	N (%)	Type	N (%)
Antrum	14 (6.8)	Superficial	109 (53.7)
Corpus	2 (0.9)	Alkaline reflux	46 (22.7)
Corpus dominant	3 (1.4)	Portal hypertensive	1 (0.5)
Pangastric	137 (67)	Hemorrhagic	0
Normal	47 (23)	Hyperplastic	0
		Normal	47 (23)

Table 3. Distribution of lesions in upper GIS endoscopy

	Localization	N (%)
Esophagus	Esophagitis	10 (4.9)
	Varices	5(2.5)
	Mass	1(0.5)
	Normal	187(92.1)
Gastritis	Gastritis	156 (76.8)
	Normal	47 (23.1)
Gastric erosion	Antrum	36(17.7)
	Corpus	2 (0.9)
	Pangastric	6(2.9)
	Normal	159 (78.3)
Gastric ulcer	Cardia	4(2)
	Corpus	5(2.5)
	Antrum	13(6.4)
	Antrum+Corpus	1(0.5)
	Normal	180 (88.7)
Bulboduodenal ulcer	Bulbus	11(5.4)
	Duodenum	1(0.5)
	Bulbus+Duodenum	0 (0)
	Normal	191(94)
Bulboduodenitis	Bulbus	10(5)
	Bulbus (Erosive)	3(1.5)
	Duodenum	7(3.4)
	Bulbus+Duodenum	6(3)
	Normal	177(87.1)
Other	Atrophy	21(10.3)
	Metaplasia	5(2.5)
	Polyp	15(7.4)
	Gastrectomy	14(6.9)
	GAVE*	1(0.4)
	Total	203

*GAVE: Gastric Vascular Ectasia

Table 4. Colonoscopic findings

Results	N (%)
Hemorrhoids	20 (19.2)
Diverticulum	
Right	2 (1.9)
Left	9 (8.6)
Angiodysplasia	
Right	0 (0)
Left	1 (0.9)
Aphthous Ulcer	4 (3.8)
Non-specific Colitis	9 (8.7)
Ischemic Colitis	0 (0)
IBH*	
Crohn's disease	1 (0.9)
Ulcerative colitis	5 (4.8)
Polyp (piece)	
<3	25 (24)
3-10	6 (5.8)
>10	0 (0)
Polyp (size)	
< 1cm	26 (25)
> 1cm	5 (4.8)
Localization	
Right	1(0.9)
Left	2(1.9)

IBH*: Inflammatory Bowel Disease

Discussion

IDA is the most common type of anaemia. It is seen in 2% of men and 5% of postmenopausal women in developed countries [7,8]. Detection of IDA in this patient group is important in terms of mortality and morbidity. In our study group, the mean age of male patients and postmenopausal female patients was similar, and the mean age was 64.17 in general. In a study conducted by Madej et al., it was shown that iron intake is sufficient (97%) in the geriatric population [8,9]. This finding suggests that the cause of IDA in the geriatric population is mostly due to chronic blood loss and malabsorption. In addition, studies conducted in different

patient groups due to iron deficiency showed that the cause was gastrointestinal with a rate of 43-86%, which formed the basis of our study [9]. Studies have shown that performing both upper and lower GIS scans in patients with IDA is more successful in determining the etiology. In a study conducted in our country, the rate of not encountering any pathology that may cause IDA was found to be 46.55% in colonoscopy, 18.75% in gastroscopy, and 3.48% when both upper and lower GIS scans were performed together [9,10]. Similarly, no pathology was found in our study with a rate of 41.3% in colonoscopy, 3.4% in gastroscopy, and 2.7% when both upper and lower GIS scans were performed together.

In the studies, the most common lesion in patients who underwent upper GIS endoscopy was found to be non-erosive gastritis (76.8%) [11]. In our study, HP infection was diagnosed histologically, and it was found positive in 72 (37%) patients. In recent years, the number of studies investigating the relationship between IDA and HP has increased. Cardenas et al. found in their study that HP infection was associated with IDA [12]. In a study conducted in our country, HP was found to be positive in 64% of patients with IDA, and another study at a rate of 41% [13,14]. This finding confirms that HP positivity is among the factors that cause IDA. On the other hand, the lower incidence in our study compared to other studies can be explained by the possibility of patients receiving HP treatment before and the possibility of multiple drug use (especially the use of anti-secretory drugs) due to the geriatric population.

Contrary to the normal population, gastric ulcer (11.3%) was more common than bulboduodenal ulcer (5.9%) in our study. This can be explained by the fact that gastric ulcer is more common in advanced age, as in our population [15,16]. Another condition associated with IDA is gastric atrophy. While the number of patients with atrophy in EGD was 21, this number increased to 27 (13.8%) after biopsy. According to this finding, it is important to take a gastric biopsy from the corpus in cases where the anaemia cannot be explained by other reasons.

CD causes IDA by malabsorption. In a study in which 490 patients with IDA were examined, 288 patients underwent gastroscopy and CD was detected at a rate of 0.69% [17]. In another study, 181 patients with IDA were examined, 160 of them had an endoscopy, 59 of them had a duodenal biopsy and 4 patients had CD (6.7%) [18]. In our study, CD was detected in 3 (1.5%) of the patients who underwent EGD. In addition, gastrectomy, which is another factor causing iron malabsorption, was observed in 14 patients (6.9%).

In our study, the most common pathologies in patients who underwent colonoscopy were found to be polyps, hemorrhoids, and diverticulum, respectively. Polyps are lesions that increase in frequency with age and need to be removed because of the possibility of transforming into malignancy [19,20]. Regardless of their characteristics, removal of all polyps detected during colonoscopy reduces the incidence of colorectal cancer by 76%-90% [19,20]. When we look at the studies examining colonoscopy data in our country, the incidence of polyp detection was 7% in Elazığ, 13.4% in Bursa, and 20.7% in Isparta [19-21]. The higher incidence of polyps in our study can be explained by the examination of the data of a specific patient population, the low patient diversity, and the advanced mean age.

Hemorrhoids are a very common anorectal disease in our country and Western societies. Hemorrhoids have been found in more than 50% of adults in the USA [19]. In studies conducted in our country, hemorrhoids were reported at a rate of 32% in Elazığ, 13.1% in İstanbul, 31% in the Turkish Republic of Northern Cyprus, and 58% in Antalya [20-24]. The reason why hemorrhoids were less common in our study may be that hemorrhoids often present with bleeding and patients with overt bleeding were not included in the study.

Although it varies with age, gender, geographical region, ethnicity, and socioeconomic level, the incidence of ulcerative colitis (UC) is 3-15/105 and the prevalence is 80-120/105 worldwide [25]. The incidence of UC in our country was found to be 3% in the study conducted in Elazığ and 18.5% in the study conducted in Bursa [19,20]. In a study in Düzce, in which lower GIS endoscopy data were retrospectively analyzed, the rate of UC was found to be 4.7% [19]. The incidence of UC was similarly 4.8% in our study group. In addition, the rate of UC was found to be higher than Crohn's disease. This can be explained by the fact that more bleeding is observed during UC.

A colonic diverticulum is a common problem, and its prevalence is directly proportional to age. While its incidence is 5% at the age of 40, it reaches 30% at the age of 60 and reaches 60% at the age of 80 [26]. 70% of patients with diverticulosis may remain asymptomatic. About 30% of them are complicated by diverticulitis and bleeding [27]. In our cases, diverticulum was diagnosed at a rate of 10.5% and no complicated diverticulum was detected. In addition, in our study, 81.8% of the diverticulum was found to be on the left side, which is consistent with the literature [28].

Angiodysplasia is an important cause of GIS bleeding, especially in the elderly, and is usually localized in the right colon. Although most of the patients with angiodysplasia are asymptomatic, IDA may also progress as chronic or mortal acute bleeding [28,29]. The frequency of angiodysplasia in healthy individuals over 50 years of age in the USA was found to be 0.8% [28]. Angiodysplasia was seen in only one patient (1%) in our study, and it was in the left colon, contrary to the literature. This may be related to the small number of patients undergoing colonoscopy.

GIS cancers are among the first diagnoses that come to mind in patients with IDA. In a study conducted in our country in patients who were examined for IDA, adenocarcinoma was diagnosed in 0.9% of patients who underwent EGD and 4.7% of patients who underwent colonoscopy [28]. In another study, the incidence of GIS malignancy was reported as 6.9% [29]. In our study, malignancy was found in 5.1% in upper GIS endoscopy, 2.9% in lower GIS endoscopy and 5.7% in all groups. The reason for the higher incidence of upper GIS malignancies may be explained by the fact that gastroscopy was performed on more patients than colonoscopy, and those colon malignancies were often excluded from our patient group because they often present with bleeding. On the other hand, this finding shows that malignant diseases of the GIS have an important place in the etiology of IDA in our country.

The limitations of our study include the small number of patients, the fact that EGD and colonoscopy were not performed together in every patient, and our study was retrospective. On the other hand,

our study is very important since there are very few studies on this subject in our country.

Conclusion

In our study, it was observed that there could be multiple lesions that could lead to IDA in male and postmenopausal female patients. Considering the high rate of lesion detection in patients undergoing EGD and colonoscopy, it is possible to say that performing both upper and lower GIS scans together is very important in determining the etiology in IDA cases.

Conflict of interests

The authors declare that they have no competing interests.

Financial Disclosure

All authors declare no financial support.

Ethical approval

Our study was carried out in Bolu Abant İzzet Baysal University Faculty of Medicine Training and Research Hospital, Department of Internal Medicine and approval was obtained from the Ethics Committee of Bolu Abant İzzet Baysal University Faculty of Medicine (no:171).

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