THE DIAGNOSTIC YIELD OF UPPER GASTROINTESTINAL ENDOSCOPY IN THE INVESTIGATION OF ANAEMIA

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ABSTRACT

Computer records of patients endoscoped over a 34-month period were studied to assess the diagnostic yield of gastrointestinal endoscopy in patients with anaemia. Patients with obvious gastrointestinal bleeding and known gastrointestinal pathology were excluded. On hundred and thirty-six patients were endoscoped for anaemia. Eighty-three of them (61%) had iron deficiency anaemia and 53 (39%) had other types of anaemia. The ages of the patients with iron deficiency anaemia (mean 56 years) were significantly lower than those of other anaemias (means 65 years), ($p<0.003$). Patient characteristics were otherwise comparable. There were significant endoscopic findings (ulcers, carcinoma and haemorrhagic or erosive gastritis) in 26 of 83 patients (31%) with iron deficiency anaemia, in 11 of 53 patients with other anaemias (21%) and 37 of 136 patients (27%) combined. Significant endoscopic findings were found in 506 of 2224 patients (23%) endoscoped during this period who were not anaemic, did not have obvious gastrointestinal haemorrhage and were not known to have gastrointestinal diseases. The diagnostic yield for iron deficiency anaemia was significantly higher than for the non anaemic group ($p < 0.05$). There was no difference between the diagnostic yields of iron deficiency and other anaemias, other anaemias and the non anaemic group, or total anaemias and the non anaemic group. Gastrointestinal symptoms and history of analgesic or steroid usage did not appear to increase the incidence of gastrointestinal lesions in either iron deficiency anaemia or other anaemias. Twenty-three of 41 patients (56%) who had no cause for anaemia found at the end of all investigations were colonoscoped. Two (9%) had significant findings (carcinoma and a polyp). Upper gastrointestinal endoscopy has a definite place in the initial investigation of iron deficiency anaemia, but in cases where it is negative, and no other diagnosis is reached, colonoscopy should be performed.

Keywords: Upper gastrointestinal endoscopy, anaemia

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INTRODUCTION

Upper gastrointestinal endoscopy (gastroscopy) is frequently one of the earliest diagnostic procedures undertaken in the investigation of anaemia, sometimes even before the anaemia has been characterised as iron deficiency, chronic disease related or macrocytic types. However, the usefulness of this investigation for anaemia has not been studied. Previous studies have concentrated more on the comparison between endoscopy and radiological methods[1-3], or the investigation of obscure causes of obvious gastrointestinal bleeding[4]. Other reports have highlighted the importance of early endoscopy in diagnosing carcinoma of the gastrointestinal tract in patients who presented with symptoms associated with anaemia[5-8].

A retrospective study was done to see how many gastroscopies were performed for the investigation of anaemia at a general hospital with diagnostic endoscopy facilities and to determine the diagnostic yield of these endoscopics. Non-steroidal anti-inflammatory analgesic drug (NSAID) or steroid use amongst the study population were noted to see whether ingestion of these agents increased the incidence of significant gastrointestinal lesions.

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METHODS

Patients

Computer records of all patients endoscoped at the National University Hospital (NUH) for the investigation of anaemia during a 34-month period from October 1985 to August 1988, were examined. The presence of symptoms related to the upper gastrointestinal tract, ie. epigastric pain, discomfort, or gaseous distension were checked. Any history of NSAID or steroid use was also noted.

Patients with obvious gastrointestinal bleeding, (haematemesis or melaena) as well as those with known gastrointestinal pathology such as carcinomas or previous peptic ulcers were excluded. Repeat endoscopies were also excluded.

We compared the results of patients with anaemia with a population consisting of all the other patients referred for gastroscopy during the same period who did not have anaemia, known active gastrointestinal pathology such as ulcers and carcinoma, and who did not manifest obvious gastrointestinal bleed. Records of repeat endoscopies were also excluded from this non anaemic group.

Diagnostic Criteria

Anaemia was defined by haemoglobin levels less than 14 g/dl in men and less than 12 g/dl in women. These levels were chosen to be consistent with the criteria for anaemia used by the Department of Clinical Chemistry, NUH, which carried out all the haemoglobin estimations for the patients in the study.

The anaemias were classified retrospectively into two groups: "iron deficiency anaemia", and "other anaemias" comprising anaemia of chronic disease, macrocytic anaemia and rarer causes. The classification was based on the results of full blood count, including the mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC), iron, vitamin B12 and folate studies, the Schilling Test, and marrow aspirate and trephine biopsy reports. Combinations of these tests were performed on the patients as deemed appropriate by the referring doctor. Patients were classified as iron deficient if they satisfied the criteria used by the Department of Clinical Chemistry, ie. serum iron less than 10.6 μmol/L in males or less than 6.6 μmol/L in females, total iron binding capacity more than 69.5 μmol/L and serum ferritin below 18 μg/L in males or below 8 μg/L in females less than 50 years of age and below 30 μg/L in females more than 50 years of age.

Significant endoscopic findings included ulcers, carcinoma, erosive or haemorrhagic gastritis, oesophagitis and polyps. Erythema of the mucosa was not considered significant.

Statistical Analysis

Categorical data were compared using the chi squared test with Yates correction where necessary and a p value < 0.05 was considered significant.

RESULTS

Patient Characteristics

During the period of review, 3313 gastroscopies were performed. Of these, 167 (4%) were for investigation of anaemia. Excluding repeat endoscopies, wrongly coded and lost records, 136 out of 2360 (6%) of the patients were found to have been endoscoped for anaemia.

These patients were retrospectively divided into those with iron deficiency anaemia and those with other anaemias. Eighty-three (61%) patients had iron deficiency anaemia and 53 (39%) patients had other anaemias (49 patients had chronic diseases, 3 patients had macrocytic anaemia and one patient had haemolytic anaemia).

Patient characteristics are summarised in Table I. Patients with iron deficiency anaemia were younger than those with other anaemias. Other characteristics were similar in the two groups of patients, although there was a tendency for the patients with iron deficiency anaemia to have lower haemoglobin levels at the time of referral.

The non anaemic group comprised 2224 patients. They were younger than the anaemic subjects, the mean age being 46 years (range 5 to 99 years). The male : female ratio was 1 : 0.96.

Table I
Patient characteristics

Anaemia	Iron Deficiency	Other Anaemias
Characteristics		
No. of Patients	83	53
Mean age (Range)	56 (15-85)	65 (19-87)
Male/Female (Ratio)	32/51 (1:1.6)	18/35 (1:2)
Mean Hb level g/dl	7.9	8.6
No. with GI symptoms (%)	18 (22%)	5 (9%)
No. taking Analgesic (%)	12 (14%)	8 (15%)
No. taking Steroids (%)	5 (6%)	3 (5%)

Endoscopic Findings

The relative proportions of significant findings on endoscopy in the 136 patients with anaemia as well as in the non anaemic group are shown in Table II.

The number of significant findings on endoscopy in women ≤ 50 and > 50 years old with iron deficiency anaemia are shown in Table III. Forty-three percent of women who were over 50 years of age had significant findings, while none of the women 50 years old or younger had significant endoscopic findings.

The diagnostic yield for patients with iron deficiency anaemia was 31%, while that for other anaemias was 21%. The yield for all anaemias was 27%. The yield for the non anaemic population was 23%. There was no difference in the diagnostic yield between iron deficiency and other anaemias, or between other anaemias and the non anaemic group. However there was a significantly higher diagnostic yield for patients with iron deficiency anaemia as compared with the non anaemic group.

The presence of upper gastrointestinal symptoms, NSAID or steroid usage were also noted between the two classes of anaemia. The results are shown in Table IV. Upper gastrointestinal symptoms, NSAID or steroid usage were not associated with an increased incidence of significant gastrointestinal lesions in either iron deficiency or other anaemias.

Colonoscopy

Of the 55 patients with no significant findings on gastroscopy, 22 had colonoscopies performed. A colonic polyp to which the iron deficiency anaemia was attributed was detected in one patient, while another had carcinoma of the colon. The yield from colonoscopy was therefore 9%.

Table II
Endoscopic findings

	Significant Findings on Endoscopy
Iron Deficiency Anaemia	26/83 (31%)[a]
Other Anaemias	11/53 (21%)[b]
Controls	506/2224 (23%)[c]

a vs c : $p < 0.05$
a vs b, b vs c : NS

Table III
Endoscope findings in women with iron deficiency anaemia ≤50 years and >50 years old

		Significant Findings on Endoscopy
≤50 years old		0/21 (0%)
>50 years old		13/29 (45%)
Ca Stomach	5	
Duodenal Ulcer	3	
Gastric Ulcer	5	

$p < 0.05$

Table IV
Upper GI symptoms, NSAID and steroid usage in patients with significant upper GI findings

Characteristics	Iron Deficiency	Other Anaemias
Upper GI symptoms	7/26 (27%)	1/12 (8%)
Analgesic usage	4/26 (15%)	3/12 (25%)
Steroid usage	2/26 (8%)	0/12 (0%)

DISCUSSION

Anaemia is not a common indication for gastroscopy. Only 6% of endoscoped patients were being investigated for anaemia during the study period. The anaemia was frequently not yet characterised before the patients were referred, but retrospectively, 61% of them were iron deficiency anaemia, which occurred in a younger age group. Non anaemic patients were also noted to be younger.

The diagnostic yield for all anaemias was 27% which was not different from the non anaemic group. Patients with iron deficiency anaemia, however had a diagnostic yield of 31% which was significantly higher than the non anaemic group. Among women, significant findings were found exclusively in those over the age of 50. A probable explanation is that menorrhagia is frequently the cause of iron deficiency anaemia in pre-menopausal women. While these figures suggest that gastroscopy is useful if the anaemia is first established to be due to iron deficiency and for women, particularly if over the age of 50 years, the fact that significant findings occur in 21% of patients with other anaemias suggests that it is unlikely that patients will be referred only if they are shown to have iron deficiency anaemia. A previous study by Stockbrugger et al on gastroscopic screening in 80 patients with pernicious anaemia found 33 cases with mucosal dysplasia, 1 case of carcinoma, 18 gastric polyps and 1 with multiple carcinoid tumours[9]. Thus, it would appear that gastroscopy of patients with pernicious anaemia, at least, is justifiable.

Despite complete diagnostic work-up including gastroscopy, 41 of 136 patients (30%) were still left with a diagnosis of "anaemia of unknown origin". Of these 41 patients, 40 had iron deficiency anaemia, and 1 had anaemia of chronic illness. Therefore 40 out of 83 (48%) patients with iron deficiency anaemia remained undiagnosed. Failure of diagnosis of this order of magnitude was also found by Hershko et al in Israel[2]. In his study on the aetiologic distribution of iron deficiency anaemia, no diagnosis was found in 34% of cases. The two patient populations may not be comparable however, since Hershko's study had older patients.

Performing colonoscopy in addition to gastroscopy appeared to be rather arbitrary in our study. Of the 41 undiagnosed patients only 23 (56%) were colonoscoped, giving rise to the question of whether more colonic pathology might have been found if all 41 had been colonoscoped. An interesting finding from Hershko's study was that the prevalence of gastrointestinal neoplasms in a hospital with a more intensive use of endoscopic procedures was significantly higher than in another hospital with less reliance on endoscopy. He also showed a prevalence of 30% of gastrointestinal neoplasms in anaemic males aged 50 to 69. Turunen et al studied the reasons for delay in diagnosing colorectal carcinoma and revealed that the main causes of delay were lack of clinical suspicion due to paucity of symptoms and signs, over reliance on negative barium enemas, and misdiagnoses of haemorrhoids and anaemia[10]. All this would suggest that endoscopy (of both upper and lower gastrointestinal tract) should be done routinely at least for cases of iron deficiency anaemia and more so in the older patient. Two of our patients benefitted from colonoscopy. One had a colonic polyp, and the other, a carcinoma of the colon. This gives the colonoscopic diagnostic yield as 9%. One explanation for colonoscopy not being done in many of our patients without a final diagnosis is that endoscopy is a service provided to patients referred by other doctors, and frequently, gastroscopy and not colonoscopy is requested for. Since most of the patients have not yet been fully worked up at the time of the endoscopy, the endoscopist, though he might recommend a colonoscopy, would have to wait for the referring doctor to decide on this based on other considerations.

The presence of symptoms related to the upper gastrointestinal tract did not give rise to a better pickup rate for significant findings probably because these symptoms are really too non specific, do not always occur in patients with pathology and frequently occur in those who have none.

A study by Collins et al showed that patients with rheumatic complaints taking NSAIDS tend to have a higher incidence of chronic gastric ulcer, duodenal ulcer, gastritis or gastric erosions compared to non rheumatic patients[11]. In addition, they were referred more frequently for anaemia, and less frequently for abdominal symptoms. Endoscopic findings also correlated more with anaemia than symptoms in rheumatic patients. In our study, the use of NSAIDs or steroids did not appear to give rise to more significant findings in these patients. Perhaps the numbers were too small.

Upper gastrointestinal endoscopy is definitely a useful procedure in the investigation of anaemia, particularly iron deficiency anaemia. Since the cause, if in the gastrointestinal tract, is frequently easily visualised, endoscopy of both the upper and lower gastrointestinal tract should not be delayed and become secondary to other investigations for anaemia of unknown origin. It should be done early in the course of the work-up, and this is particularly important when there is a possibility of discovering a carcinoma that should be dealt with without delay.

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