

## A Cross-sectional Assessment of Indications and Findings of Upper and Lower Gastrointestinal Endoscopy in Population of Al Kharj Province, KSA

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### Article History

Received: 13.08.2018

Accepted: 19.08.2018

Published: 30.08.2018

### DOI:

10.21276/sjm.2018.3.8.13



**Abstract:** Many patients with gastrointestinal (GI) symptoms go through endoscopy often unnecessarily and without indication. Observational studies have generally shown poor adherence to international guidelines of endoscopy. This study aims to identify the common indications of GI endoscopy and the subsequent findings among the population of Al Kharj Province, KSA. We conducted a cross-sectional study on 516 patients who underwent upper or lower GI endoscopy at the Endoscopy Unit of King Khaled Hospital, Al Kharj, KSA in the period from March 2017 to March 2018. GI bleeding, dyspepsia and reflux symptoms were the most commonly reported causes for referral to endoscopy (26.8%, 19.6% and 10.7% respectively). Normal endoscopic findings were reported in 33% and 37% of the patients who underwent gastroscopy with dyspepsia and reflux symptoms, respectively. Only six patients (1.8%) of those who underwent colonoscopy had an indication of colorectal screening. Almost half of the patients 45 % (45/100) with dyspepsia 53% (27/55) unnecessary gastroscopy. High rates of unnecessary upper GI endoscopy are performed for inappropriate indication such as dyspepsia and reflux symptoms. Also, colorectal screening strategy has not been adopted by the physicians. We recommend the implementation of the recent international guidelines when referring patients to endoscopy to avoid the unnecessary invasive procedures.

**Keywords:** Endoscopy, Colonoscopy, Dyspepsia, Gastrointestinal bleeding, Reflux.

## INTRODUCTION

Endoscopy is a nonsurgical procedure used to examine the gastrointestinal tract under sedation and analgesia. Physicians use upper gastrointestinal endoscopy (UGIE) to examine esophagus, stomach and duodenum while the lower gastrointestinal endoscopy (LGIE) is used to examine the large intestine[1].

## BACKGROUND

The problems of unnecessary endoscopy are that it exposes the patient to prolonged waiting lists for endoscopic procedures, to the risk of complications such as bleeding, perforation, and infection and finally burdens healthcare resource from an economic point of view[1]. Therefore, it is encouraged to evaluate endoscopic procedures performed in healthcare setting to find the cases of unnecessary endoscopy and put the appropriate measures and guidelines to avoid them.

Guidelines for the appropriate use of endoscopy have been proposed in 2012 by the

American and in 2013 by the British Society of Gastroenterology (ASGE/BSG) [2, 3]; they recommend that upper GI endoscopy should be performed if the endoscopic results are likely to influence the management of the patient or if an empiric treatment for a suspected benign disorder has been unsuccessful. In addition, endoscopy can be used as an alternative to the radiographic evaluation or if a therapeutic maneuver may be needed.

A recent study[4] in Saudi Arabia of dyspeptic patients who underwent UGIE showed that 63% met ASGE guidelines indications for UGIE and 50% had abnormal endoscopic findings while UGIE was not indicated in remaining 37% of patients. Furthermore, in Saudi Arabia (SA), there is no countrywide policy for CRC screening despite the increasing incidence of the disease[5]. Recently, clinical practice guidelines for CRC has been published in the country[6]. In summary, data from Saudi Arabia assessing the prevalence and clinical features of endoscopic findings

and the adherence of general practitioners to the international indications of UGIE and LGIE are scant.

### AIMS AND OBJECTIVES

The aims of this study concluded as

- to identify the common indications for endoscopy,
- to determine the appropriateness of upper and lower GI endoscopy requests,
- to evaluate adherence of general physicians (GPs) to international guidelines when referring patients for endoscopy,
- to evaluate the importance of “red flag” symptoms, and to determine the prevalence of endoscopic findings in Al-Kharj Province, KSA.

### MATERIALS AND METHODS

#### Ethical consideration

We followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement guidelines when reporting this manuscript.<sup>7</sup> This study was approved by the ethics committee of King Khaled Hospital (IRB approval 27/03/2017, no: PSAU/COM/RC/IRB/P/8).

#### Study design, setting and duration

We conducted a retrospective observational cross-sectional study in the King Khaled Hospital, a major teaching hospital affiliated to the Prince Sattam Bin Abdulaziz University in Al-Kharj province, KSA. The study was done within the period from March 2017 to March 2018.

#### Study groups and study participants

Our study included 516 patients who underwent UGIE and LGIE at our center. Those patients were referred by primary care physicians over a 1-year period and underwent upper or lower GI endoscopy for any indication. All included patients gave a written informed consent.

#### Sampling method and sample size calculation

We employed a convenience sampling method. Within the study period of March 2017 to March 2018, all patients who underwent UGIE or LGIE at the study setting were eligible for inclusion in this study.

#### Determination of necessary or unnecessary endoscopy

Referral reason for endoscopy will be classified as appropriate or inappropriate according to the ASGE/BSG [2,3].

#### Appropriate referral to endoscopy

When the patient is above 50 years old or presenting with alarm symptoms as: anemia, vomiting, loss of appetite, weight loss, gastrointestinal bleeding, dysphagia or the presence of a palpable abdominal mass at any age.

#### Inappropriate referral to endoscopy

When the patient is under the age of 50 with typical symptoms such as dyspepsia according to ROME IV criteria [8] and acid reflux according to American[9,2] and British Guidelines[3].

Endoscopic findings are considered abnormal in case of any mucosal abnormalities as gastritis, duodenitis, peptic ulcer, varices, features of celiac disease, hiatus hernia, adenomatous polyps, malignancy and other. Otherwise, the endoscopic findings are considered normal.

Anemia was assessed by laboratory investigations of Hemoglobin, Mean Cell Volume and Mean Hemoglobin concentration. Liver disease with portal hypertension was assessed by a combination of physical examination, lab investigations and imaging data. Ultrasonography studies were done to investigate the presence of gallstones and the severity of acute cholecystitis in case of upper gastrointestinal (GI) symptoms, splenomegaly, ascites, or cirrhotic liver.

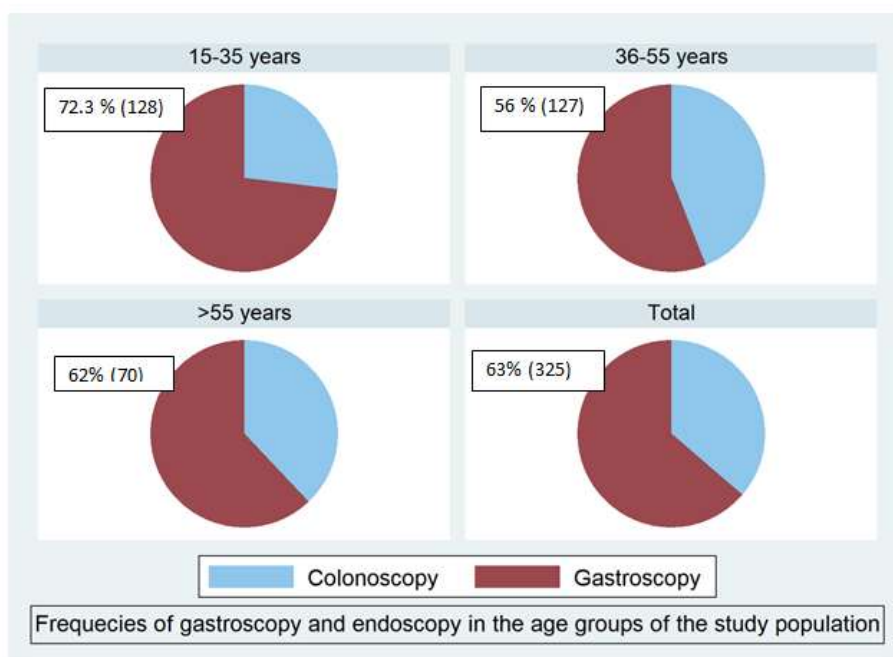
#### STATISTICS

Data normality was tested using the Kolmogorov Smirnov test. Categorical data were described as frequency and percentages while continuous data were described as mean and standard deviation. The association between categorical variables was tested by the Chi square test. For comparing continuous variables, we used the student t-test and Mann Whitney U test for normally and non-normally distributed data, respectively. An alpha level below 0.05 was considered for statistical significance. All analyses were performed using SPSS version 17.0 software.

#### RESULTS

##### Demographic characteristics of the study population

Our study included 516 patients. Of them, 325 patients (63%) underwent gastroscopy while 191 patients (37%) underwent colonoscopy. The population age ranges from 15 to 65 years with a mean age of 43.1 years. The frequency of gastroscopy and colonoscopy operations performed in different age groups is shown in Figure 1.



**Fig-1: Frequencies of colonoscopy and gastroscopy in the age groups of the study population**

**Referral reasons for endoscopy**

The most common indication for gastroscopy was GI bleeding (26.8%) followed by dyspepsia (19.6%) and Gastroesophageal reflux disease (GERD) symptoms (10.7%). The frequency of endoscopy indications in our study population is shown in Table 1.

Of the 325 patients who underwent colonoscopy, only 6 patients (1.8%) had an indication of colon screening. Furthermore, of the 191 patients who underwent gastroscopy, the great majority 45% (45/100) had inappropriate indication such as dyspeptic symptoms.

**Table-1: Referral reasons for endoscopy**

Referral reasons	N (%)	Referral reasons	N (%)
GI Bleeding	138 (26.8%)	Chronic anemia and/or iron deficiency	42 (8.2 %)
Bleeding diarrhea	12 (2.3%)	Dyspepsia symptoms*	100 (19.6%)
Chronic diarrhea	9 (1.7%)	Nausea or vomiting	38 (7.4%)
Constipation	9 (1.7%)	GERD symptoms**	55 (10.7%)
Weight loss	18 (3.4%)	Dysphagia and/or odynophagia	20 (3.8%)
Abdominal pain	52 (10.1%)	Barret's esophagus	0 (0%)
Polypectomy surveillance	3 (0.6 %)	Celiac disease***	7 (1.3%)
Colorectal surveillance	6 (1.1 %)	Portal hypertension/ esophageal varices	7 (1.3%)
Pathological bowel wall thickening detected by other imaging procedures	0 (0%)	Lost foreign bodies in the rectum/stomach	0 (0%)

\* abdominal swelling/distention, early satiety, postprandial fullness, epigastric discomfort/pain, nausea or vomiting

\*\* Heartburn, regurgitation, dysphagia and/or odynophagia including atypical symptoms such as nocturnal cough, asthma, pain mimicking angina, hoarseness, burning sensation in the pharynx, ear pain

\*\*\* celiac disease (iron deficiency anemia of unknown etiology), folic acid deficiency (combined with gastric biopsy); chronic diarrhea

**Endoscopic Findings**

The most common endoscopic findings in the 138 patients presenting with GI bleeding were as follows: hemorrhoids (n=49), colorectal cancer (n=18), peptic ulcer (n=15), and inflammatory bowel disease (n=12). Among the 100 patients presenting with dyspepsia, the most common endoscopic findings were

*Helicobacter pylori* (n=65), normal mucosa (n=36), and atrophic gastritis (n=8). Among the 55 patients presenting with GERD symptoms, 37 patients had normal mucosa while 9 patients had esophagitis and 8 patients had hiatal hernia. Of the 325 patients who underwent colonoscopy, 46 patients (14%) had colonic polyps. The frequencies and percentages of the

endoscopic findings associated with the presenting symptoms are shown in Table 2.

**Table-2: Associations between endoscopic findings and referral reasons for endoscopy**

Endoscopic Findings	N(%)	Upper GI endoscopic findings	N(%)
Upper or lower GI Bleeding	138 (26.8%)	Dyspepsia	100 (52.4%)
Haemorrhoids	49 (35.5 %)	H. Pylori (+/-) gastritis	56 (56%)
PUD	15 (10.9 %)	Atrophic gastritis	8 (8 %)
Diverticulae	3 (2.2%)	Ulcers	3 (3%)
Hemorrhagic polyps	11 (8%)	Normal mucosa	33 (33%)
Angiomas	2 (1.4 %)	MALT/adenoCA	0 (0%)
Esophageal variceal bleeding	7 (5.1 %)	GERD symptoms	55 (28.8%)
IBD	12 (8.7 %)	Oesophigitis	9 (16.5 %)
CRC	18 (13%)	hiatal hernia	8 (14.6 %)
Gastric malignancy	4 (2.9%)	stenosis	1 (0.1 %)
Other*	17 (12.3%)	diverticulae	0 (0)
Colonoscopy	325 (63%)	Barret's oesophagus	0
Polyps	46 (14%)	Normal Mucosa	37 (68.8%)

CRC: colorectal cancer, IBD: Infammatory Bowel Disease, MALT: mucosa-associated lymphoid tissue, adenoCA: adenocarcinoma

Other causes of GI bleeding: gastric erosions, oesophagitis, Mallory-weiss, GAVE (gastric antral vascular ectasia)

## DISCUSSION

Endoscopy is a non-invasive procedure used to visualize the alimentary tract; it includes upper GI endoscopy (esophagogastroduodenoscopy) and lower GI endoscopy (colonoscopy). High quality endoscopy is crucial in modern medicine. It ensures that the patient receives an indicated, correct and highly safe procedure in addition to making clinically relevant diagnosis and providing a proper therapy[1].

We aimed to assess the quality of endoscopic procedures performed at King Khaled hospital in Al Kharj province by performing a cross-sectional study measuring the indications and clinically relevant findings of endoscopic procedures and determining the appropriateness of endoscopic referrals by Primary care physicians.

The most common reasons for referral were Gastrointestinal bleeding, dyspepsia and reflux symptoms (26.8%, 19.6% and 10.7% respectively). According to the ASGE and BSG, endoscopy is not indicated immediately with typical symptoms as dyspepsia or acid reflux unless the patient is above 50 years old or had concomitant alarm symptoms as weight loss, dysphagia, bleeding, and anemia[2,3].

This highlights the gravity of the situation since in our study nearly 50% of the patients with dyspepsia underwent endoscopy unnecessarily and without indication. Furthermore, about 1/3 had normal mucosa. Unfortunately, data about the quality of endoscopic procedures are scarce in the Middle East

and particularly in Saudi Arabia. In one study, only 63% of Saudi Arabian patients underwent upper gastrointestinal endoscopy met ASGE guidelines with 50% having abnormal endoscopic findings[4].

Inappropriate endoscopy exposes the patient unnecessarily to hazards of the procedure while also increasing the burden on available limited resources[2,3,10,11,12]. The reasons behind this high number of unindicated endoscopy procedures includes lack of awareness of the guidelines and incomplete or faulty history taking.

The most common finding in patients referred to endoscopy with dyspepsia is gastritis (64%), of these patients only 3% had ulcers. The recommendations of the international guidelines suggest that dyspeptic patients who are over the age of 50 years and/or those with alarm symptoms at any age need urgent referral for endoscopy as an initial management strategy because endoscopy would change the management plan of this subset of patients[13-15]. But in young patients without alarm symptoms either a “test or treat” for *Helicobacter pylori* in high-prevalence areas or an empirical acid-suppression trial are the initial management strategies of choice[14] Saudi Arabia has a high prevalence rate of *Helicobacter pylori* (about 50%)[16].

Alomost 2/3 of patients presenting with reflux had normal mucosal findings while 16% of them had esophagitis and 14% had hiatal hernia. Current guidelines recommend that lifestyle modification and acid-suppression therapy should be enough to relieve

the symptoms and give a chance for endoscopic mucosal healing in patients without alarm symptoms such as dysphagia, weight loss and persistent vomiting[17].

Another significant finding of our study is that only 1.8% of patients who underwent colonoscopy had an indication of colorectal screening while 14% had polyps of those who underwent colonoscopy. The Multi-Society Task Force of Colorectal Cancer, composed of the American College of Gastroenterology, the American Gastroenterological Association, and the American Society for Gastrointestinal Endoscopy, issued updated CRC screening guidelines in 2017 recommending screening of patients beginning at age 50 years[18]. In conclusion, the colorectal screening in Al Kharj is in a preliminary stage although recently, clinical practice guidelines for CRC has been published in the country[6]

### Strength points and limitation

Our study has several strength points including: [1] we performed a laboratory analysis and ultrasonography together with the endoscopy in order to confirm the suspected endoscopic findings, [2] the relatively large sample size of our study (n=315 patients); and [3] the classification of endoscopy as indicated or not indicated was done based on the recent guidelines of the ASGE and BGS. The limitation of our study is that we did not assess the economic impact of the unindicated endoscopic procedures. Future studies should address the health economic burden of unnecessary endoscopy.

### CONCLUSIONS

High rates of unnecessary upper GI endoscopy are performed for inappropriate indications such as dyspepsia. Clinical practice guidelines for CRC in the country have not yet been adopted. We recommend the implementation of the recent international guidelines when referring patients to endoscopy to avoid the unnecessary invasive procedures.

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