Role of gastroscopy in gastro-oesophageal reflux disease (GORD)

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Abstract

Background

This two-year study is a retrospective analysis of records of patients diagnosed with gastro-oesophageal reflux disease (GORD) at a private medical aid society for the period January 2002 to December 2003. In this study of GORD and its complications, the use of gastroscopy as a staging criteria and the cost of treatment were evaluated. Patients with alarming symptoms (chronic gastrointestinal bleeding, progressive unintentional weight loss, progressive difficulty in swallowing, persistent vomiting, iron deficiency anaemia, epigastric mass or suspicious barium meal), those with complications of GORD (erosive oesophagitis, ulcerative oesophagitis, oesophageal strictures, Barrett's oesophagus and oesophageal adenocarcinoma), and patients in whom symptoms have not resolved need to have a gastroscopy performed. If left untreated, some of these symptoms could lead to more severe and serious complications. Accurate recognition of these symptoms will help to identify, evaluate and treat patients timeously. The use of the gastroscopy allows for the detection of complications of GORD, which helps to identify patients with complications timeously and avoids, delays or stops the progression of the complications of GORD. However, the unnecessary use of gastroscopy in patients without complications results in unnecessary costs. Patients without alarming symptoms or complications should be treated empirically with proton pump inhibitors (PPIs) to resolve the symptoms of GORD.

Methods

One thousand seven hundred and fifty-three patients with GORD were identified from computer records at a private medical aid society for the period January 2002 to December 2003. These patient records were retrospectively analysed using the computer database. All newly diagnosed GORD patients (n = 586) who were on drug therapy were included in the study. These patients were divided into two subsets: those without gastroscopy (n = 211) and those with gastroscopy (n = 375). The latter group was further identified as those that had undergone one (n = 232) or more than one gastroscopy (n = 143). Patients were further subdivided into those with and without complications. The choice of the study population was not based on the complication or the severity of the symptoms, but on whether or not the attending doctor chose to have a gastroscopy done.

Results

The number of complications detected in patients with more than one gastroscopy was the highest (34%; n = 48) in comparison to patients with one gastroscopy (21%; n = 49) or without gastroscopy (7%; n = 15) ($p < 0.001$). The odds or chances of having complications were significantly greater in patients with one gastroscopy compared to those without gastroscopy (OR 3.5; 95% CI: 1.8-6.9). Having an additional gastroscopy increased the odds of complications significantly compared to patients with just one gastroscopy (OR 1.9; 95% CI: 1.1-3.1). Barrett's oesophagus occurred in 1.9% (n = 4) of patients without gastroscopy and in 15.7% (n = 59) of patients with gastroscopy ($p < 0.001$).

Discussion

Patients without gastroscopy presented with the lowest number of complications. The performance of gastroscopy in patients with alarming symptoms or complications may have resulted in more complications being detected. In subjects without gastroscopy, the prevalence of Barrett's oesophagus was low. The proportion of subjects with complications is strongly associated with the number of gastroscopies they had undergone. Multiple gastroscopies increased the likelihood of detecting complications. Thus, a gastroscopy should only be performed if the symptoms of GORD do not resolve or if the patient has alarming symptoms or complications after empirical therapy.

Conclusion

The performance of gastroscopy in patients who had not undergone a gastroscopy before may have resulted in more complications being detected. Having more than one gastroscopy significantly increased the odds of detecting complications compared to patients with who had only undergone one gastroscopy. Patients without alarming symptoms should be treated empirically for one to two months, and a gastroscopy should only be performed if the symptoms do not resolve or if the patients experience complications or alarming symptoms.[1] This study was confined to a single medical aid society. For comparison, other medical aids should be included.

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Introduction

Gastro-oesophageal reflux disease (GORD) occurs when hydrochloric acid from the stomach refluxes into the oesophagus, thus causing inflammation in or injury to the oesophagus.[2] GORD is diagnosed by subjective symptoms (e.g. heartburn) and objective criteria (gastroscopy, ambulatory pH monitoring).

When a patient experiences the symptoms of GORD, the first option would appear to be for a gastroscopy to be performed. However, patients without alarming symptoms should be treated empirically for two months for the symptoms to be resolved.[1] Most patients experience relief from the symptoms of GORD after a few months of treatment with proton pump inhibitors (PPIs). However, patients with complications of GORD (erosive oesophagitis, ulcerative oesophagitis, oesophageal strictures, Barrett's oesophagus and oesophageal adenocarcinoma) or alarming symptoms (chronic gastrointestinal, bleeding; progressive unintentional weight loss, progressive difficulty in swallowing, persistent vomiting, iron deficiency anaemia, epigastric mass or suspicious barium meal), or those in whom symptoms have not resolved, require gastroscopy to be performed.[1] A second gastroscopy may need to be undertaken to evaluate for underlying Barrett's oesophagus that may have been missed on the initial examination.

Method

This study is a retrospective analysis of patients diagnosed with GORD at a private medical aid society. This large private medical aid society has members nationally. The study reviewed patient records. A request was submitted to the Information Technology (IT) department for information to be extracted from the database for a period of two years. The study population comprised South Africans of African decent, Coloureds, Asians, and whites. The medical records of all patients diagnosed with GORD, with or without gastroscopy, were reviewed. Data requested from the IT department of the Sovereign Health National Medical Plan (NMP) included the following:

- The number of all current, active newly-diagnosed patients with GORD
- The age/race/sex of the subjects
- The number of gastroscopies (gr) performed on each subject within the time frame
- The number of patients that did not have gastroscopy within the study period
- History of concurrent illnesses
- History of medication for GORD and concurrent illnesses
- Complications of GORD
- The duration of GORD treatment
- The cost of drug therapy with or without gastroscopy
- The cost of gastroscopy
- Cost of complications of GORD

Ethical clearance was obtained from the University of KwaZulu-Natal. Permission to access medical aid information was obtained from National Medical Plan.

Inclusion criteria:

- Compliant subjects
- Newly diagnosed
- On current treatment for GORD
- No previous treatment for GORD

Exclusion criteria:

- Previous treatment for GORD
- Intermittent treatment for GORD
- Non-compliant subject
- Subjects who died (cause of death was non-GORD related)

Results

Figure 1 provides a graphic representation of the data relating to the subjects that were included in the study and those that were excluded.

The two subsets (with gastroscopy and without gastroscopy) were equally matched for sex, age and ethnicity. The directly-related medical conditions associated with GORD were diaphragmatic hernia, anaemia and peptic ulcer. The indirectly-related concurrent medical conditions identified were osteoporosis, osteoarthritis, asthma, rheumatoid arthritis and angina pectoris. NSAIDS, calcium channel blockers, aspirin, COXIB inhibitor, COX II inhibitor, enteric-coated aspirin and alendronate were the most commonly used drugs that affect GORD in both the subsets.

Complications were detected in a third of the patients (34%) with more than one gastroscopy. In patients with one gastroscopy, complications were detected in 21% of the patients and in patients without gastroscopy the complications were only detected in 7%.

Table 1 provides an analysis of patients with and without complications in patients that did or did not have a gastroscopy.

Figure 1: Schematic representation of exclusion and selection of subjects in the study cohort

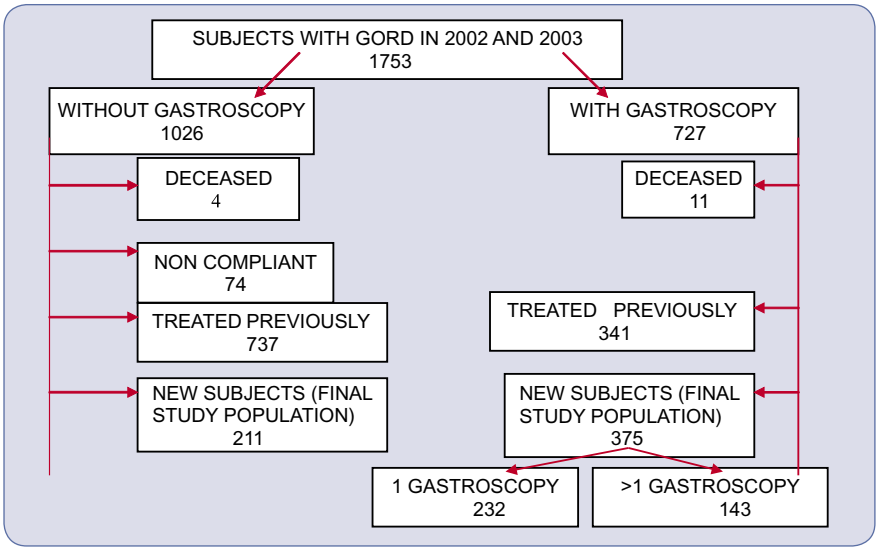


Table I: Analysis of complications in patients with or without gastroscopy.

	Patients without gastroscopy % (n)	Patients with gastroscopy % (n)		
		Number of gastroscopies		
	0	1	> 1	Total
Complications	7 (15)	21 (49)	34 (48)	25.9 (97)
Without complications	93 (196)	79 (183)	66 (95)	74.1 (278)
Total	211	232	143	375

Barrett's oesophagus was found in 1.9% (n = 4) of patients without gastroscopy and in 15.7% (n = 59) of patients with gastroscopy (see Table II). Barrett's oesophagus was found to be statistically significant in patients with and without gastroscopy ($p < 0.001$). The subset with gastroscopy included a higher percentage of white male patients with Barrett's oesophagus.

Table 11 shows an anlysis of patients detected with the different complications of GORD in patients with or without gastroscopy.

A total of 9.5% of patients without gastroscopy (n = 20) had been treated for GORD for less than six months and 32% (n = 120) of patients with gastroscopy had been treated for less than six months. Of the patients without gastroscopy, 76.3% (n = 161) had been treated for more than 12 months and 38% (n = 142) of the patients with gastroscopy had been treated for more than 12 months.

The approximate cost of gastroscopy per subject was R338 for the two-year period (2002 to 2003). The approximate cost of drugs per subject with gastroscopy was R7 672 for the two-year period. This gives a total cost of treatment per subject with gastroscopy of approximately R8 010 per two-year period. This cost includes the cost of drugs and gastroscopy and excludes theatre fees, gastroenterologist consultation, ward fees and theatre drugs. The cost of treatment per subject without gastroscopy was approximately R2 127.

The costs shown in the schematic representation in Figure 2 below include the cost of drugs and gastroscopy (R338) per subject (2002 to 2003). For example, in patients with Barrett's oesophagus, the cost of the drugs was R6 272 and the cost of the gastroscopy was R338. In combination, the total cost for both gastroscopy and drugs was R6 610.

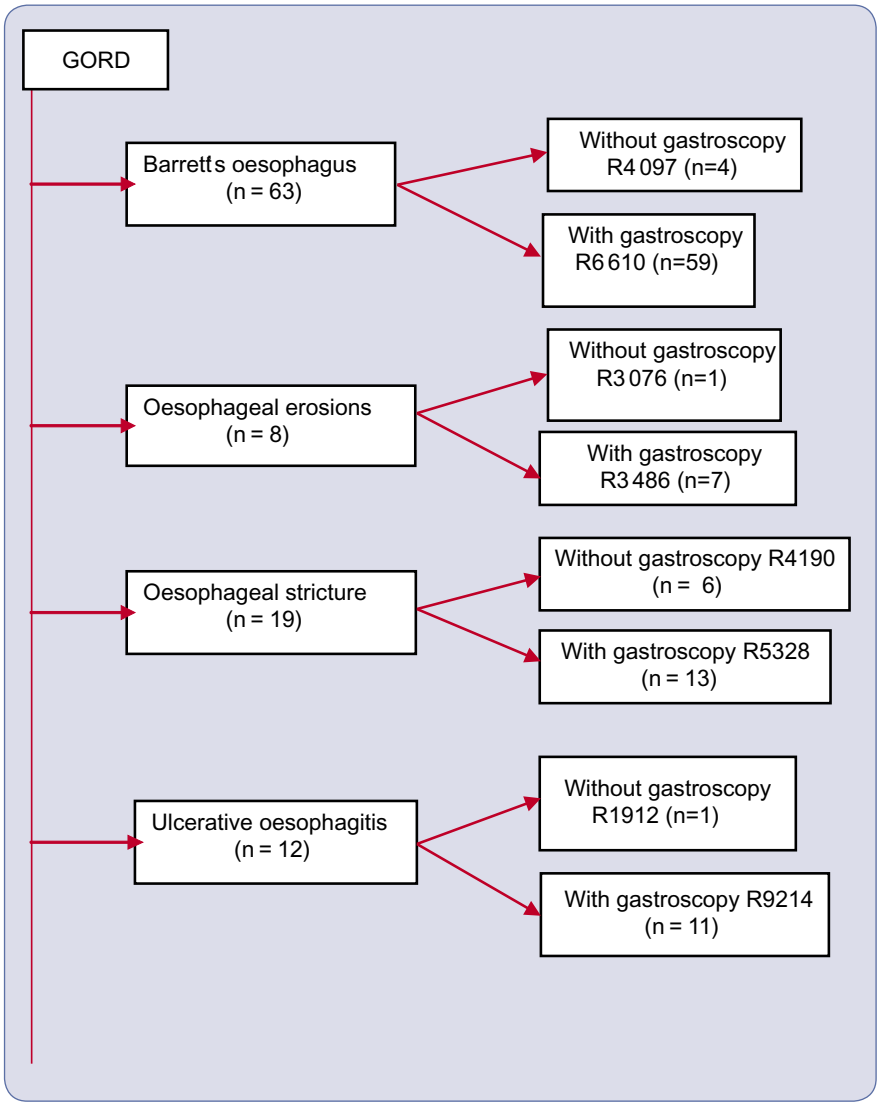
Figure 2 represents the cost of drugs and gastroscopy per subject

Proton pump inhibitors (PPI) were used in 84% (178) of patients without gastroscopy and in 87.6% (331) patients with gastroscopy.

Table II: Complications directly related to GORD in patients with or without gastroscopy

Complications	No gastroscopy % (n)	1 gastroscopy % (n)	>1 gastroscopy % (n)	Total (≥1 gastroscopy) % (n)	p value
Ulcerative oesophagitis	0.5 (1)	3 (7)	2.7 (4)	3 (11)	0.06
Oesophageal erosions	0.5 (1)	1 (3)	2.7 (4)	1.9 (7)	0.3
Oesophageal stricture	3 (6)	2.4 (6)	4.8 (7)	3.4 (13)	0.8
Barrett's oesophagus	2 (4)	12 (28)	21.7 (31)	15.7 (59)	<0.001
Cough	0 (0)	0.4 (1)	0(0)	0.3 (1)	0.9
Chest pain	0 (0)	2 (4)	0(0)	1.2 (4)	0.3
Dyspnoea (nocturnal)	0.5 (1)	0(0)	0(0)	0	0.4
Reflux laryngitis	0.5 (1)	0(0)	0.7 (1)	0.3 (1)	0.9
Reflux into mouth	0 (0)	0(0)	0.7 (1)	0.3 (1)	0.9

Figure 2: Schematic representation of cost of drugs and gastroscopy per subject (January 2002 to December 2003).



Discussion

Osteoporosis, osteoarthritis, asthma and rheumatoid arthritis occurred in similar frequency in both the population groups. The drugs used for these diagnoses aggravate GORD. NSAIDS, calcium channel blockers, aspirin, COX-IB inhibitor, COX II inhibitor, enteric-coated aspirin and alendronate were the most commonly used drugs that affect GORD in both the subsets. Calcium channel blockers, biphosphonates and NSAIDs have been mentioned in the NICE guidelines as possible causes of dyspepsia.[1] Drugs used for concurrent diagnoses that aggravate GORD need to be discontinued and an alternative treatment should be considered. If these drugs cannot be discontinued, a

proton pump inhibitor should be added to the subject's drug treatment.

Patients without gastroscopy presented with the lowest number of complications. The performance of gastroscopy in these patients may have resulted in more complications being detected. The decision to perform a gastroscopy should be based on whether the subject had complications of GORD or if the symptoms of GORD had not been resolved after empirical therapy.[1] The clinician needs to base his/her diagnosis on objective evidence (gastroscopy) and not only on symptoms. Patients with serious complications may remain undetected.

A total of 74.1% of the study population with gastroscopy presented without complications. Patients without alarming symptoms should be treated empirically for two months, which would eliminate the need for gastroscopy and hence reduce medical expenses.[1] There would have been a cost saving in direct (gastroscopy) and indirect (theatre fees, gastroenterologist consultation, ward fees, theatre drugs) medical expenses. One of the key discussions and conclusions in the GENVAL Guidelines was that patients with a typical history of uncomplicated GORD should be given empirical therapy after careful symptom analysis without diagnostic investigation.[3] If this fails, or if the subjects have symptoms suggesting complications, they should undergo a gastroscopy. The South African Gastroenterologists Society (SAGES) supports and endorses the GENVAL guidelines.[4] Gastroscopy is indicated if the symptoms continue or if the patients develop complications. These guidelines are not being adhered to.

According to the NICE guidelines, routine endoscopic investigation of patients presenting with dyspepsia and without alarming symptoms is not necessary.[1] However, for patients over 55 years of age with complications, gastroscopy should be considered. According to the NICE guidelines, a subject presenting with dyspepsia and without alarming symptoms should be offered one to two months of full-dose PPI. The American College of Gastroenterology[(5)] and the British Society of Gastroenterology (BSG) also suggests empirical treatment with PPIs in patients without alarm symptoms. [6] The South African Gastroenterologists Society (SAGES) supports the BSG in its position statements and guidelines.[(7)]

The percentage of patients without complications in both the groups confirms that the two groups in this study were not chosen on the basis of their complications. Patients with gastroscopy were further subdivided into those having had one and those having had more than one gastroscopy. There was a statistically significant difference in detecting complications between the patients with one or more than one gastroscopy ($p < 0.001$). The proportion of patients with complications being detected is significantly associated with the number of gastroscopies they had undergone. The odds or chances of detecting complications were significantly greater in patients with a single gastroscopy than in those without gastroscopy. Having had more than one gastroscopy increased the odds of detecting complications significantly compared to patients with just one gastroscopy (OR 1.9; 95% CI: 1.1-3.1).

This is in accordance with international guidelines, which recommend more than one gastroscopy in non-resolving complications of GORD. Gastroscopy is necessary in patients with complications and in whom symptoms have not resolved. Patients with oesophageal complications of GORD need to be diagnosed objectively with a gastroscopy. Certain patients with oesophageal complication may require more than one gastroscopy to monitor serious complications.

Gastroscopy is a diagnostic tool and the lack of its use in some patients may account for the small number of cases of Barrett's oesophagus detected in patients without gastroscopy (n = 4). Patients with complications of GORD should undergo endoscopic evaluation. Gastroscopy is essential to detect Barrett's oesophagus, thus endoscopic surveillance every two to three years may be inappropriate, since Barrett's oesophagus has to be treated quickly and as early as possible. If dysplasia is detected, gastroscopy needs to be performed on a yearly basis.[8] When low-grade dysplasia is present, the interval is shortened to every six months for one year, followed by annual surveillance. If high-grade dysplasia is detected on biopsy, an expert histopathologist should confirm the findings. When the confirmation is consistent with high-grade dysplasia, surveillance every three months is appropriate.[9,10]

The mean age of development of Barrett's oesophagus is estimated to be 40 years, yet the mean age at diagnosis is 63 years. This suggests that a premalignant disorder may be present for up to 20 years before it is clinically recognised.[9] The timeous investigation of patients with complications may avoid or delay the progression of complications of GORD. The diagnosis of Barrett's depends upon a histological examination, with the finding of intestinal goblet cells in the oesophageal biopsies. Although the diagnosis is made histologically, one should have a high index of suspicion for Barrett's oesophagus in patients with a long history of reflux symptoms.[11] Some patients who have suffered with heartburn find that the heartburn has become less severe or has disappeared over recent months or years. This is because patients with Barrett's oesophagus often lose their sensitivity to acid and bile reflux, probably on the basis of damage to sensory nerves in the oesophageal mucosa.[11]

More patients (76.3%) without gastroscopy were treated for longer than 12 months in comparison to patients with gastroscopy. This was statistically significant ($p < 0.001$). Although patients had a lower percentage of complications in these groups, they were treated for a longer period of time. If these patients had a gastroscopy done, more complications may have been detected. Patients with complications need to be treated for a longer period of time. This is due to the mucosal damage that has occurred over a period of time, leading to serious complications (Barrett's oesophagus, oesophageal strictures). According to the NICE guidelines, patients who have severe GORD symptoms or who have a proven pathology (e.g. oesophageal ulceration, Barrett's oesophagus) should be treated with a higher healing dose of a PPI until symptoms have been controlled.[1] Patients without gastroscopy need to be objectively assessed in order to determine whether they have complications to warrant a longer duration of treatment with PPIs.

Based on the results obtained, one could recommend that patients with uncomplicated GORD be treated for two months with empirical PPI therapy. Gastroscopy should only be performed if the symptoms do not resolve or if these patients experience complications or alarming symptoms. However, the only exception to this would be patients older than 55 years who present with symptoms of GORD for the first time, on whom a gastroscopy should be performed.[1]

The costs for patients with gastroscopy examined in this study included the cost of drugs and gastroscopy and excluded theatre fees, gastroenterologist consultations, ward fees and theatre drugs. The cost of treatment per subject for patients with gastroscopy was 3.8 times more than that for patients without gastroscopy. However, gastroscopy is an objective criteria that leads to the detection of complications and hence more intense and directed treatment.

It would seem that it is less expensive to treat those patients who have not undergone gastroscopy. However, based on pharmaco-economic principles, it costs more in the long term to treat patients who had not undergone a gastroscopy. Undetected and therefore untreated complications result in resistance to treatment and a prolonged healing time, which may lead to Barrett's oesophagus and adenocarcinoma. This causes costs to escalate.

While the cost per patients for the subset with gastroscopy was higher, the diagnosis of GORD was conclusive. Therefore, it allows for targeted therapy based on conclusive evidence. Although the expenses incurred in the subset with gastroscopy are higher, it is more cost effective in the long term since the complications will be treated promptly.

Proton pump inhibitors were the most commonly used drugs in patients with and without gastroscopy. This concurs with international and national guidelines, which advocate the use of PPIs as first-line agents in GORD. PPIs form the cornerstone of treatment for GORD and have been documented to be superior to H_2-receptor antagonists (H2RA) in meta-analyses for the healing of erosive oesophagitis.[12] According to this study, the PPI most commonly used in patients with and without gastroscopy was lansoprazole, while omeprazole was the second most commonly prescribed PPI. This may be due to omeprazole and lansoprazole being on the market for the longest or due to the cheaper generic products available.

Conclusion

In this retrospective analysis of patients diagnosed with GORD at a private medical aid, the following were found:

- Patients in the subset with gastroscopy had more complications of GORD than those in the subset without gastroscopy.
- Patients with complications of GORD or in whom symptoms had not resolved require objective criteria (gastroscopy) to diagnose GORD. These complications include oesophageal erosions, oesophageal ulcer, oesophageal stricture and Barrett's oesophagus.
- The patients with gastroscopy who did not have complications should first have been treated empirically instead of having a gastroscopy performed. Gastroscopy should not be used unnecessarily unless there are complications or if symptoms do not resolve.
- Patients without gastroscopy were treated for a longer time than compared with patients with gastroscopy. The guidelines were not followed in these patients. Patients without complications should be treated empirically for one to two months. The cost of treatment seemed lower for patients without gastroscopy. However, based on pharmaco-economic principles, it costs more in the long term to treat patients who have not undergone a gastroscopy. This could be due to undetected, untreated and therefore resistant complications.
- Drugs like NSAIDS, alendronate, calcium channel blockers and theophylline aggravate GORD. These drugs should be discontinued and, if they cannot be discontinued, the use of PPIs for the protection of the gastric mucosa is recommended.

The NICE guidelines recommend that the routine endoscopic investigation of patients of any age presenting with dyspepsia and without alarm signs is not necessary. These patients should be treated empirically for approximately one to two months before undergoing a gastroscopy. A gastroscopy should only be performed if the symptoms persist or if there are complications of GORD. Gastroscopy is an objective criterion that detects complications in patients with GORD. It is not indicated if there are no complications. However, in patients aged 55 years and older with unexplained and persistent recent-onset dyspepsia alone, an urgent referral for endoscopy should be made.

Limitations

This study was confined to a single medical aid society. For comparison, other medical aids should be included. For the results to be more generalisable, it would be necessary to conduct research on mixed populations which include subjects of high and low income. The study population was restricted to people who could afford medical aid, which may be a source of selection bias.

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