

Yield of Endoscopy of the Upper Digestive Tract in Relation to Ethnic Descent: A Single Center Retrospective Study

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ABSTRACT

Introduction: Not much is known of the yield of upper gastrointestinal endoscopy (UGE) in relation to ethnic descent.

Aim: Study findings in UGE in relation to the ethnicity.

Material & Methods: A prospectively collected dataset was studied retrospectively. Presence five major endoscopic findings (Hiatal hernia, peptic ulcer, oesophagitis, malignancy and gastritis) was studied. The patients were divided in groups: Group 1 patients of Turkish descent, group 2 patients of Arabic descent, group 3 Asian descent, and group 4 patients of Western descent.

Results: The data set comprised of 38205 consecutive UGE's. The number of men undergoing UGE was significantly higher in patients of group 2. Patients in groups 1 and 2 significantly had more often no macroscopic abnormalities. All phenotypes of reflux disease were significantly more often seen in patients of group 4. Signs indicative of gastritis were significantly less often seen in patients from group 4. Patients belonging to group 2 had significantly less often peptic ulcer disease. Malignancies were significantly more often diagnosed in patients in group 4 (group 1: 0.73%, group 2: 0.3%, group 3: 1%, and group 4:3.1%).

Conclusion: There are differences in upper gastro-intestinal morbidity patterns if ethnicity is taken into account. It would be interesting to study what the reasons for these differences are. Prevalence of *H.pylori* infection is a plausible explanation. Dietary habits and body mass index could be an explanation for the high prevalence of reflux disease in the Western population.

INTRODUCTION

In daily practice endoscopy of the upper gastro-intestinal (UGE) tract is applied on a regular basis. Mostly the procedure is done because of upper abdominal complaints (dyspepsia and reflux complaints). The overall yield of the procedure is high [1].

It is well-known that certain diseases or abnormalities occur more often in people of a specific race or ethnic descent. For instance, sickle cell anemia is much more often seen in patients of African descent compared with for instance the Western population. People from African descent do not respond well to therapy with ACE-inhibitors.

It already was shown that yield of colonoscopy differs if ethnic descent of the patient is taken into account [2].

There are some data in the literature on the yield of UGE in different groups of patients [3-5]. The ethnic descent of the patient could be of importance in the beforehand chance of detecting abnormalities during UGE.

A study was done in a large prospectively collected dataset of UGE's in order to determine the yield of the procedure in relation to the ethnic descent.

MATERIAL & METHODS

A prospectively collected dataset of UGE's covering more than 25 years was studied retrospectively. All endoscopies were done in the Zaans Medical Center, the community hospital of the Zaanstreek region in The Netherlands.

The procedure was done with Olympus™ (with fiber optic endoscopes in 1992 and 1993, and from 1994-2013 video endoscopes) and Fujinon™ endoscopes (since 2013).

The most prevalent endoscopic diagnoses were evaluated. These were: insufficient cardia closure or hiatal hernia; oesophagitis, nodular and/or erosive gastritis, peptic ulcer disease; malignancy; and metaplastic epithelium in the oesophagus (Barrett's oesophagus).

In the course of time, patients could undergo more than one

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UGE. Patients were sent again for UGE because of recurrent or new complaints. Development of new abnormalities in oesophagus, stomach or duodenum is possible. If during a new UGE, for whatever reason, one of the above-mentioned findings was seen as a new diagnosis, then this finding was added cumulatively in the endoscopic diagnoses already made in this specific patient. Of course, patients can have or develop more than one of the major findings.

In the Zaanstreek region the majority of inhabitants is authentic Dutch or of Western descent. In addition, there are people originating from different countries. There is a large population of Turkish descent (almost 11% of the total population). In addition, people from Morocco, but also a smaller number of refugees from the Middle East live in the Zaanstreek region. Also, people from Asian descent (mostly Indonesia and Hong Kong) but also from Indian-Suriname descent form a significant population.

In the Netherlands the descent or place of birth of every person is registered. These data are incorporated in the hospital registration system and retrieved if necessary. In addition, people of a specific ethnicity born in the Netherlands were identified by their family name.

To the best of our knowledge the patients could be divided in four groups. Group 1 patients of Turkish descent, group 2 patients originating from Morocco, Northern Africa and the Middle East (Arabic descent). Group 3 patients of Asian descent and finally group 4 all patients of Western descent, including Italian and Spanish people but also patients originating from Central or Eastern Europe.

Statistical analysis was done with chi-square test for contingency tables. A value below 0.05 was considered significant.

RESULTS

The data set comprised of 38205 consecutive UGE's. In patients of group 1 3825 procedures were done in 2575 patients, in group 2 this was 1105 in 852 patients. In group 3, 647 in 504 patients, and finally in group 4, 32889 in 24420 patients.

Table 1 shows the gender in the different groups. The number of men undergoing UGE was significantly higher in patients of group 2.

Table 2 shows the numbers of UGE's in which abnormalities were diagnosed and the number of procedures without macroscopic abnormalities. Patients in groups 1 and 2 significantly had more often no macroscopic abnormalities in oesophagus, stomach and duodenum.

Table 3 shows the presence of the most prevalent findings in the four groups of patients. All phenotypes of reflux disease (insufficient closure of the cardia, hiatal hernia, oesophagitis and Barrett's) were significantly more often seen in patients of group 4. Signs indicative of gastritis were significantly less

often seen in patients from group 4, but significantly more often in patients of groups 1 and 2. Patients belonging to group 2 had significantly less often peptic ulcer disease.

Malignancies were significantly more often diagnosed in patients in group 4 (group 1: 0.73%, group 2: 0.3%, group 3: 1%, and group 4:3.6%) **Table 4**.

DISCUSSION

Despite the fact that UGE is applied frequently in many countries as diagnostic and therapeutic instrument, little is known about the yield in different races or ethnicities of the patients.

The present study reports the yield of UGE in relation to ethnicity or descent in a large cohort of patients. There are several interesting observations.

A procedure without any macroscopic abnormality was clearly significantly more often seen in patients of Turkish and Arabic descent. Of course, it can be that many of these patients had microscopic gastritis. The present study does not give clues about the prevalence of *H.pylori* infection in the different ethnic groups. It was not possible to retrieve histological data. However, in the literature data on prevalence have been reported. Mahamid M et al. studied the prevalence of *H.pylori* infection Jews and Arabs living in Israel [6]. They detected no differences in outcomes of UGE or in presence of *H.pylori*. However, differences in *H. pylori* genotypes among the ethnic groups occur [7]. *H. pylori* appears to be associated with a reduced severity of reflux in Indians [5]. Erosive or nodular gastritis is indicative of *H.pylori* infection [8]. In the present study nodular and erosive gastritis was significantly less often diagnosed in patients of Western descent (group 4). The condition was significantly more often present in patients of Turkish and Arabic descent. Indirectly, this suggests presence of active *H.pylori* infection in these groups.

It is clear that all phenotypes of reflux disease are significantly more often seen in patients of Western descent. In an earlier, much smaller, study from the Zaanstreek region in the Netherlands, it already was shown that reflux disease occurred significantly less often in immigrants, 24% versus 55.5% ($P < 0.0001$) [9].

Hewett et al. found Barrett's oesophagus to be less prevalent in patients from the Indian subcontinent [4]. On the other hand, Indians appeared to have a higher prevalence of Barrett's oesophagus compared with Chinese ($P < 0.05$) or Malays ($P < 0.01$). Hiatus hernia and erosive esophagitis were both positively associated with Barrett's metaplasia ($P < 0.01$) [10]. In the present study patients of Asian descent had the same low prevalence of reflux disease compared with patients from Turkish or Arabic descent.

Ulcers were significantly less often present in patients of Arabic descent. Although it is generally known that peptic ulcer disease has a high prevalence in cases of *H.pylori*

Table 1. The gender of patients in the different groups.

	Group 1	Group 2	Group 3	Group 4
Men	1139(44.2%)	438(51.4%)	228(45.2%)	11106(45.5%)
women	1436(55.8%)	414(48.6%)	276(54.8%)	13314(54.5%)
	P <0.001			

Table 2. Presence of macroscopic abnormalities and procedures without distinctive features.

	Group 1	Group 2	Group 3	Group 4
Abnormalities	1433(55.7%)	483(56.7%)	368(73.1%)	17179(71.1%)
No distinctive features	1142(44.3%)	369(43.3%)	136(26.9%)	7061(28.9%)
	P <0.001			

Table 3. Presence of the defined abnormalities in the different groups of patients.

	Group 1	Group 2	Group 3	Group 4	P value
Card/hiatal	522(20.3%)	181(21.2%)	104(20.6%)	9739(28.9%)	<0.001
Oesophagitis	213(8.3%)	78(9.2%)	34(6.7%)	4436(18.2%)	<0.001
Gastritis	271(10.5%)	84(9.8%)	32(6.3%)	1215(5%)	<0.001
Ulcer	136(5.3%)	26(3.1%)	29(5.8%)	1487(6.1%)	<0.001
Malignancy	20(0.77%)	3(0.3%)	5(1%)	762(3.1%)	<0.001
Barrett	9(0.34%)	1(0.1%)	4(0.8%)	1025(4.2%)	<0.001

Card/hiatal=Presence of insufficient closure of the gastric cardia/hiatal hernia
 Gastritis=Erosive or nodular gastritis

Table 4. Presence of malignancies in the four groups of patients.

	Group 1	Group 2	Group 3	Group 4
Cancer of the oesophagus	5	1	1	398
Cancer of the gastric cardia	2	1	1	88
Distal stomach cancer	12	1	1	265
Cancer of the duodenum	1	-	-	34
In growing pancreatic cancer	-	-	2	11

infection, ulcers were significantly more often seen in patients of groups 3 and 4. The reason for this is not obvious. Possibly the use of NSAID's in the Western population could be a factor. However, there are differences in presentation of peptic ulcer if Turkish people are compared with authentic Dutchmen. Turkish patients with peptic ulcer disease are younger and mostly men. In addition, most of the ulcers in Turkish patients are associated with *H.pylori* infection [11]. There also are differences in the presence of ulcer disease and

reflux oesophagitis in men and women of Turkish descent. Men are significantly more often *H. pylori*-positive and Turkish men suffered more often from reflux oesophagitis (81% vs. 19%, P < 0.0001), hiatus hernia (58% vs. 42%, P < 0.0001) and peptic ulcer disease (74% vs. 26%, P < 0.0001) [12].

Malignancy was significantly more often diagnosed in patients of Western descent. It already was shown that

colorectal malignancies are quite rare in patients of Turkish descent [13].

The same seems to be true for oesophageal and proximal stomach cancer. Saumoy et al. described differences in race and ethnicity with respect to non-cardia gastric cancer prevalence within the United States [14].

A possible shortcoming of the present study is that age was not calculated for every patient. On the other hand, this was not possible. All endoscopic diagnoses were cumulated. In a single patient it could be possible that during the first endoscopy only erosive gastritis was seen while during a next endoscopy (many years later) oesophagitis was diagnosed. What age of the patient should then be noted?

Another point of criticism could be that upper GI-endoscopy is not easily available for immigrants. This is not the case in the Netherlands. The health system is accessible for every inhabitant. Medical insurance is mandatory, even for refugees from the Middle East or other war zones.

It can be concluded that there are differences in upper gastrointestinal morbidity patterns if ethnicity is taken into account. It would be interesting to study what the reasons for these differences are. Is it dietary habits, or life style? Prevalence of *H. pylori* infection is a plausible explanation for differences in erosive or nodular gastritis and even peptic ulcer. Dietary habits and body mass index could be an explanation for the high prevalence of reflux disease in the Western population. It would be interesting to study whether immigrants adapt in their new environment and will develop more reflux. Identification of environmental factors responsible for this difference would be of value.

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