

## Research Article

# Knowledge of Indications for Endoscopic Ultrasound among Egyptian Gastroenterologists and Non-Gastroenterologists

**Altonbary AY\* and Bahgat MH**Department of gastroenterology and hepatology,  
University of Mansoura, Egypt**\*Corresponding author:** Altonbary AY, Department of gastroenterology and hepatology, University of Mansoura, Gomhoreya st, Mansoura, Egypt, Tel: 201005100091; Email: a.tonbary@gmail.com**Received:** February 11, 2015; **Accepted:** June 01, 2015;**Published:** June 10, 2015**Abstract**

**Background:** The level of awareness of the indications for EUS is unknown in Egypt. The aim of this study is to assess knowledge of the indications for EUS among both gastroenterologists and non-gastroenterologists in Egypt.

**Patients and Methods:** A questionnaire was designed that tested knowledge of the indications for EUS with respect to 4 organ systems: esophagus, gastro duodenum, hepatopancreatobiliary system and colorectum. The questionnaire was distributed manually to medical and surgical gastroenterologists and non-gastroenterologists in Mansoura hospitals.

**Results:** The survey was distributed to 272 physicians (68 for each group, CI: 90%). The median of the total score varied by specialty, with a higher score for medical gastroenterologists (66%) compared with medical non-gastroenterologists (56%), surgical gastroenterologists (64%), and surgical non-gastroenterologists (60%). For each physician group, the ranking of EUS knowledge with respect to the 4 anatomical areas was as the following: the gastroduodenum was always highest (mean 75% correct), followed by hepatopancreatobiliary system (68.2%), esophagus (60%), and colorectum (40%), which was the lowest.

**Conclusion:** Both gastroenterologist and non-gastroenterologist in Egypt have moderate knowledge of the indications and the utility of EUS. Knowledge was at the lowest level for esophagus and colorectal applications. Future studies should be aimed at devising methods for the education of non-gastroenterologists, with a primary focus on the role of EUS in the esophagus and the colorectum for both gastroenterologists and non-gastroenterologists and assess the impact of such education on the appropriateness of EUS referral patterns.

**Keywords:** Endoscopic ultrasound; EUS; Indications; Survey; Egypt

**Abbreviations**

EUS: Endoscopic Ultrasound; GI: Gastrointestinal; FNA: Fine Needle Aspiration

**Introduction**

Since the first description of EUS (endoscopic ultrasound) in 1980 [1,2], this imaging technology has developed into one of the most accurate modalities available for evaluating malignancies of the GI tract and pancreas [3,4]. In addition to being a highly accurate approach for assessing the depth of invasion of luminal tumors of the esophagus and rectum, several studies have demonstrated that EUS influences the management of patients with these malignancies [5-7]. In Egypt, EUS is only available at limited centers. Characterization of gastroenterologist knowledge of EUS will identify areas that require improvement through education. A broader and improved understanding of the indications and utility of EUS may ultimately lead to more appropriate patient referrals for EUS by non-gastroenterologists. The aim of this study is to assess knowledge of the indications for EUS among both gastroenterologists and non-

gastroenterologists in Egypt.

**Patients and Methods**

A survey designed to assess knowledge of EUS was distributed manually to medical gastroenterologists (68), medical non-gastroenterologists (68), surgical gastroenterologists (68), and surgical non-gastroenterologists (68) who practice at Mansoura Specialized Medical Hospital, Mansoura University Hospital, Mansoura International Hospital, Mansoura General Hospital, Mansoura Oncology Hospital, Gastroenterology Surgical Center and Talkha Hospital. The responses were returned manually to the principal investigator, and the data were analyzed. If no reply was received after 1 month, the recipient was considered a non-respondent and replaced by another physician of the same category to complete the minimum required sample size.

**Survey instrument**

A previously validated questionnaire that addressed the indications for EUS in 4 organ systems: esophagus, gastroduodenum, hepatopancreatobiliary, and colorectum (Appendix). The first two

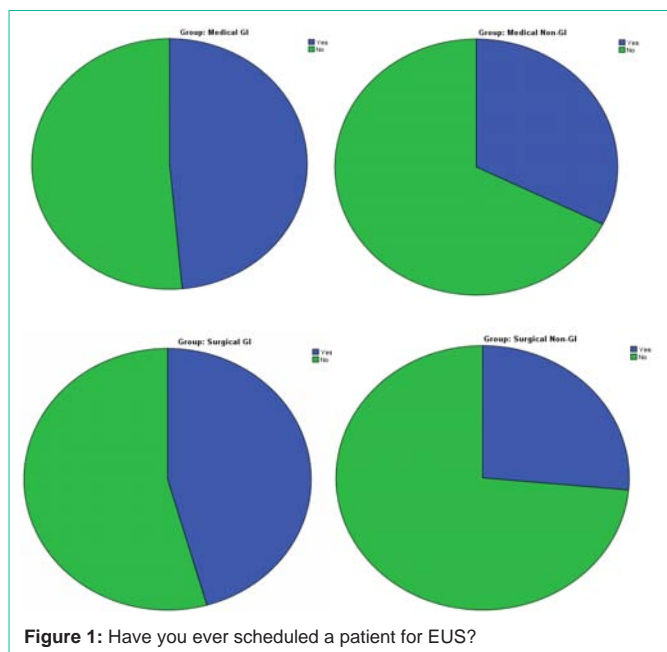


Figure 1: Have you ever scheduled a patient for EUS?

questions in the survey addressed medical specialty of the physician and prior patient referral for EUS. The organ-specific section comprised 25 questions, which assessed diseases of esophagus (5 questions), gastroduodenum (6), hepatopancreatobiliary tract (9) and colorectum (5). Failure to answer a question was considered an incorrect response for the purposes of analysis. Care was taken to incorporate elements for most recommended indications for as follows: Indication 1 (tumor staging): addressed by questions 1 (esophagus); 1, 3 (gastroduodenum); and 1 (colorectum). Indication 2 (assessing wall abnormalities): addressed by questions 2 (gastroduodenum) and 2 (colorectum). Indication 3 (tissue sampling): addressed by questions 5 (gastroduodenum) and 9 (hepatopancreatobiliary). Indication 4 (evaluating pancreas abnormalities): addressed in questions 2, 4, 6 (hepatopancreatobiliary). Indication 5 (evaluating biliary tree abnormalities): addressed by question 8 (hepatopancreatobiliary). Indication 6 (EUS-guided therapy): addressed in question 7 (hepatopancreatobiliary).

**Statistical analysis**

Sample size of 272 physicians (68 for each group, CI: 90%) was calculated by using Epi-info program (version 7). A summary of the median for the overall score and the median organ specific category score for each physician group was constructed. For each of the 25 questions, the proportion of correct responses recorded by various physician groups was compared by using a chi-square test. For each of the organ specific categories, scores were compared by kruskal-wallis test followed by Mann-whitney test when appropriate. A p value <0.05 was considered statistically significant.

**Results**

Among all physicians, 104 (38.2%) had referred patients for an EUS procedure; of which 64 (61.5%) were gastroenterologists ( $X^2=8.967$  and  $p=0.003$ ). Considering medical vs surgical subspecialties, statistical significance was only detected between medical and surgical gastroenterologists vs non-surgical gastroenterologists ( $X^2=7.056, 5.392$  and  $p=0.008$  and  $0.02$  respectively) (Figure 1). The

median of the total score varied by specialty, with a higher score for medical gastroenterologists (66%) compared with medical non-gastroenterologists (56%), surgical gastroenterologists (64%), and surgical non-gastroenterologists (60%). Statistical significance was only detected between medical gastroenterologists and medical non-gastroenterologists ( $p=0.024$ ) (Figure 2). When performance of the various physician groups according to organ specific categories (esophagus, gastroduodenum, hepatopancreatobiliary system, and colorectum) was compared (Table 1), scores among the four groups were not significantly different except for applications of EUS in the gastroduodenum where medical and surgical gastroenterologists performed better than other groups ( $p=0.001$ ). For each physician group, the ranking of EUS knowledge with respect to the 4 anatomical areas was as the following: the gastroduodenum was always highest (mean 75% correct), followed by hepatopancreatobiliary system (68.2%), esophagus (60%), and colorectum (40%), which was the lowest. When performance of the various physician groups for each question (25 questions) was compared (Table 2), statistical significance was detected in the following: in the application of EUS in evaluation of sub mucosal masses between medical gastroenterologists vs medical and surgical non-gastroenterologists ( $X^2=8.843, 4.955$  and  $p=0.003, 0.026$  respectively), in the application of EUS in sampling of suspicious perigastric lymph nodes between medical gastroenterologists vs medical non-gastroenterologists and surgical gastroenterologists ( $X^2=8.601, 7.652$  and  $p=0.003, 0.006$  respectively), and in the application of EUS in evaluation of fecal incontinence between surgical non-gastroenterologists vs medical gastroenterologists and non-gastroenterologists ( $X^2=13.110, 5.765$  and  $p<0.0001, 0.016$  respectively), and between surgical vs medical gastroenterologists ( $X^2=4.484$  and  $p=0.034$ ).

**Discussion**

EUS at the beginning was performed by endosonographers or gastroenterologists with extensive training to solve digestive diseases. The imaging has improved our understanding of many disease states, including sub mucosal tumors of the digestive tract, mucosal gastric and esophageal cancers, early pancreatic malignancy and nodal metastases. EUS guided Fine Needle Aspiration (FNA); first reported

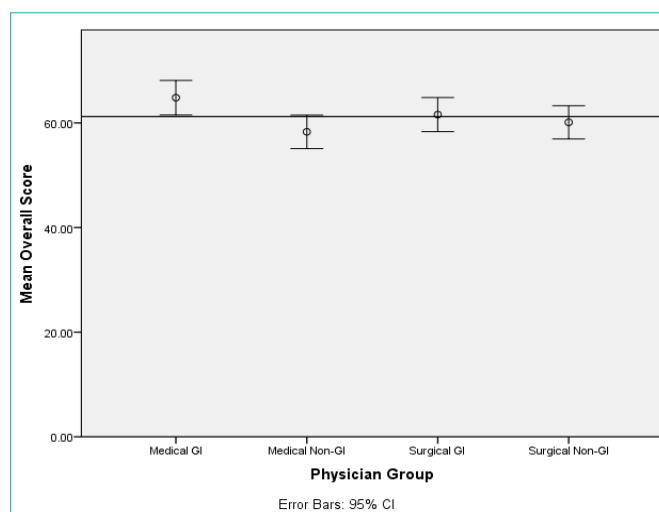


Figure 2: Error bars showing statistical significance between medical gastroenterologists and medical non-gastroenterologists.

**Table 1:** Average score per speciality.

Organ system	Medical GI	Medical Non-GI	Surgical GI	Surgical Non-GI
Esophagus (5 questions)	60%	60%	60%	60%
Gastroduodenum (6 questions)	83%	67%	83%	67%
Hepatopancreatobiliary (9 questions)	72%	67%	67%	67%
Colorectum (5 questions)	40%	40%	40%	40%
Total (25 questions)	<b>66%</b>	<b>56%</b>	<b>64%</b>	<b>60%</b>

in 1992, has increased the accuracy of EUS in the diagnosis and staging of malignancies, which plays an important role in managing treatment selection [8]. EUS has progressed from a purely imaging modality to one that can provide a tissue diagnosis (EUS-guided FNA) and can deliver therapy (interventional EUS). As utilization increases, adequate knowledge of EUS among non-gastroenterologists assumes greater importance. The present study is the first in Egypt to characterize the knowledge base of both gastroenterologists and non-gastroenterologists regarding the indications for EUS. As expected, gastroenterologists had a better knowledge of EUS than non-gastroenterologists. However, both gastroenterologists and non-gastroenterologists were defective in the knowledge of the application of EUS in the esophagus and colorectum. Moreover, the findings indicate that the application of EUS is least understood in the following: in evaluation of sub mucosal masses for medical and surgical non-gastroenterologists, in sampling of suspicious perigastric lymph nodes for medical non-gastroenterologists and surgical gastroenterologists, and in evaluation of fecal incontinence for medical gastroenterologists and non-gastroenterologists. Although this result could also reflect differences in the relative difficulty of survey questions between sections, it highlights a need for educational programs that increase knowledge of EUS applications in these organ systems. Future studies should be aimed at devising methods for the education of non-gastroenterologists, with a primary focus on the role of EUS in the esophagus and the colorectum for both gastroenterologists and non-gastroenterologists. Such studies also should assess the impact of education on the appropriateness with regard to EUS referral patterns. The present study has several limitations. It was conducted at a single city in Egypt (Mansoura), which limits the generalizability of the findings. The knowledge level of participants may have been overestimated by the fact that responders were likely to have some knowledge of the application of EUS, as opposed to those who opted not to respond (response bias). Lastly, data were not obtained regarding the level of seniority of responding physicians; these would have been informative as to the relation between physician experience and knowledge of EUS.

### Conclusion

Both gastroenterologist and non-gastroenterologist in Egypt have moderate knowledge of the indications and the utility of EUS. Knowledge was at the lowest level for esophagus and colorectal applications. Future studies should be aimed at devising methods for the education of non-gastroenterologists, with a primary focus on the role of EUS in the esophagus and the colorectum for both gastroenterologists and non-gastroenterologists and assess the impact of such education on the appropriateness of EUS referral patterns.

**Table 2:** The score for each question per speciality.

Question no.	Medical GI	Medical Non-GI	Surgical GI	Surgical Non-GI
1	83.8% (57/68)	91.2% (62/68)	94.1% (64/68)	86.8% (59/68)
2	39.7% (27/68)	47.1% (32/68)	54.4% (37/68)	47.1% (32/68)
3	61.8% (42/68)	47.1% (32/68)	47.1% (32/68)	48.5% (33/68)
4	57.4% (39/68)	54.4% (37/68)	50% (34/68)	44.1% (30/68)
5	44.1% (30/68)	36.8% (25/68)	32.4% (22/68)	30.9% (21/68)
6	91.2% (62/68)	80.9% (55/68)	85.3% (58/68)	83.8% (57/68)
7	92.6% (63/68)	73.5% (50/68)	82.4% (56/68)	79.4% (54/68)
8	70.6% (48/68)	61.8% (42/68)	72.1% (49/68)	75% (51/68)
9	77.9% (53/68)	66.2% (45/68)	72.1% (49/68)	69.1% (47/68)
10	79.4% (54/68)	55.9% (38/68)	57.4% (39/68)	66.2% (45/68)
11	60.3% (41/68)	35.3% (24/68)	55.9% (38/68)	39.7% (27/68)
12	82.4% (56/68)	80.9% (55/68)	85.3% (58/68)	77.9% (53/68)
13	83.8% (57/68)	76.5% (52/68)	67.6% (46/68)	70.6% (48/68)
14	73.5% (50/68)	67.6% (46/68)	80.9% (55/68)	66.2% (45/68)
15	80.9% (55/68)	66.2% (45/68)	66.2% (45/68)	73.5% (50/68)
16	72.1% (49/68)	70.6% (48/68)	75% (51/68)	61.8% (42/68)
17	63.2% (43/68)	44.1% (30/68)	63.2% (43/68)	54.4% (37/68)
18	50% (34/68)	39.7% (27/68)	44.1% (30/68)	54.4% (37/68)
19	60.3% (41/68)	63.2% (43/68)	54.4% (37/68)	61.8% (42/68)
20	66.2% (45/68)	44.1% (30/68)	50% (34/68)	52.9% (36/68)
21	76.5% (52/68)	70.6% (48/68)	83.8% (57/68)	88.2% (60/68)
22	29.4% (20/68)	39.7% (27/68)	47.1% (32/68)	60.3% (41/68)
23	66.2% (45/68)	69.1% (47/68)	64.7% (44/68)	60.3% (41/68)
24	33.8% (23/68)	42.6% (29/68)	30.9% (21/68)	27.9% (19/68)
25	23.5% (16/68)	32.4% (22/68)	23.5% (16/68)	22.1% (15/68)

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