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South Korean endoscopists' attitudes toward endoscopic ultrasound for the evaluation of gastrointestinal diseases

ENDOSCOPY

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Original Article

ABSTRACT

Background/Aims: Despite the common use of endoscopic ultrasound (EUS) for various gastrointestinal diseases in Asia, little is known about Asian endoscopists' attitudes toward the practice. The aim of our study was to provide a profile of Korean endoscopists' attitudes toward EUS use.

Materials and Methods: Self-administered questionnaires were distributed to endoscopists who attended the 4th EndoFest symposium of the Korean Society of Gastrointestinal Endoscopy on March 24, 2012. We evaluated opinions on the need for EUS for assessing gastrointestinal diseases and the perceived barriers to widespread EUS use.

Results: Data from 214 (32.4%) responders were analyzed. Positive opinions (agree plus strongly agree) were given on the need for EUS in the evaluation of the following gastrointestinal diseases were: subepithelial tumor (94.9%), early esophageal cancer (88.8%), early gastric cancer (86%), pancreatic cancer (84.1%), early rectal cancer (83.6%), gallbladder polyp (73.4%), advanced esophageal cancer (47.7%), colon cancer (32.2%), advanced gastric cancer (31.8%), and advanced rectal cancer (28.5%). Significant differences were observed when they were asked about the need for EUS with respect to early versus advanced cancers of the esophagus, stomach, and rectum (all $p<0.001$). The most commonly cited barrier to widespread use of EUS was lack of experienced endosonographers (66.2%).

Conclusion: This is the first study to assess Korean attitudes toward using EUS for evaluating gastrointestinal diseases. Korean endoscopists highly value the use of EUS in the evaluation of early esophageal, gastric, and rectal cancers, as well as subepithelial lesions.

Keywords: Attitude, endoscopic ultrasound, neoplasms

INTRODUCTION

Since its introduction in the early 1980s, endoscopic ultrasound (EUS) has emerged as an important imaging modality for the evaluation of malignant diseases of the hollow viscus and biliopancreas, as well as subepithelial tumors. In fact, during the past 25 years, a body of literature has detailed the accuracy of EUS for the diagnosis and staging of gastrointestinal (GI) malignancies and has demonstrated that EUS can alter management decisions regarding a significant number of patients.

Reports on Western endoscopists' clinical attitudes toward EUS use for gastrointestinal malignancies have been published (1,2). However, Eastern endoscopists' clinical attitudes in this regard remain largely unknown. It has been suggested that the opinions of Western and Eastern endoscopists regarding early gastrointestinal malignancies are different (3). For instance, Eastern endoscopists, especially those in South Korea and Japan, prefer to treat early gastrointestinal malignancies endoscopically. In this aspect, the value of EUS can be

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differently weighed in each part of the world. The incidence of disease is also different between Western and Asian countries. In addition, in South Korea, the National Cancer Screening Program (NCSP) currently provides free screening services for five common cancers (gastric, liver, colorectal, breast, and cervical) to Medical Aid recipients and National Health Insurance beneficiaries within the lower 50% income bracket (4). The NCSP recommends biennial gastric cancer screening with an upper gastrointestinal series (UGI) or endoscopy for men and women aged 40 years and older. As a result, the rate of diagnosis of early gastric cancer is very high in Korea.

In this context, Korean and Western endoscopists may differ in their clinical attitudes toward EUS use. Thus, we designed a prospective survey to assess this group's clinical attitudes toward using EUS for the evaluation of early or advanced gastrointestinal malignancies and subepithelial tumors.

MATERIALS AND METHODS

Study subjects

Self-administered questionnaires were distributed to all Korean endoscopists who attended the 4th EndoFest symposium of the Korean Society of Gastrointestinal Endoscopy (KSGE) on March 24, 2012. There were supposed to be a total of 681 potential participants with or without the credential from the Korean Board of Gastrointestinal Endoscopy (KBGE) issued by the KSGE. The KBGE credential is provided after successful completion of 1-2 years of education or training to gain clinical competence in endoscopy and passing the official examination. This credential covers the following endoscopic procedures: esophagogastroduodenoscopy (EGD), sigmoidoscopy, colonoscopy, polypectomy, endoscopic mucosal resection (EMR), and endoscopic submucosal dissection (ESD). However, it does not cover EUS or endoscopic retrograde cholangiopancreatography (ERCP).

The study protocol (MDCR-12-005-PRO-001-R) was approved by the institutional review board of Catholic University of Daegu School of Medicine, Daegu, Korea. Written informed consent was obtained from each respondent.

Questionnaire (see appendix)

The questionnaire was composed of 10 questions, which took less than 5 min to complete. The survey remained anonymous for the purposes of data analysis. Data also included responders' age, sex, possession of the KBGE credential, practice type, specialty, years in practice, availability of EUS, and opinions on the need for EUS in the assessment of gastrointestinal diseases. The considered diseases were early esophageal cancer (EEC), advanced esophageal cancer (AEC), early gastric cancer (EGC), advanced gastric cancer (AGC), pancreatic cancer (PC), gallbladder polyp (GB polyp), colon cancer (CC), early rectal cancer (ERC), advanced rectal cancer (ARC), and subepithelial tumor (SET). Perceived barriers to more common use of EUS and sources used by endoscopists for information about EUS were also asked.

Construction of variables

Practice type was dichotomized into academic and non-academic as follows: "general hospital," "private office/clinic," and "health promotion center" were considered non-academic. Participants were asked to rate their opinions on the need for EUS on a 5-point Likert scale (strongly agree, agree, undecided, disagree, and strongly disagree). All variables were dichotomized, and "strongly disagree", "disagree", and "undecided" were treated as negative responses.

Questionnaire administration

Self-administered questionnaires were distributed at the registration area to all registered attendees of the 4th EndoFest symposium. Participants who did not return the self-administered questionnaire by the end of the 4th EndoFest symposium were considered non-responders. Surveys that were only partially completed were considered incomplete and were excluded from the dataset.

Questionnaire validity

We used a pilot survey among 20 endosonographers who were members of the Korean EUS Study Group of the KSGE to collect feedback regarding the length, clarity, and content of the questions. The structural validity of the questionnaire was tested and found to measure abstract content. The test-retest reliability of the questionnaire was assessed among the same group of potential subjects, who were retested after 1 week. The range of concordance for questionnaire items was high (κ=0.85-1.00).

Statistical analysis

Student's t-test was used to test for associations between continuous variables (age, years in practice). McNemar's test was used to assess differences in positive opinions about the need for EUS for early versus advanced cancers of the esophagus, stomach, and rectum. Pearson's chi-square tests were used to test for associations between categorical variables (sex, practice types, specialty, availability of EUS, and positive opinions on the need for EUS) and possession of the KBGE credential. Fisher's exact test was used for expected cell counts of fewer than 5. The statistical association between possession of the KBGE credential and positive opinions was also assessed by logistic regression, adjusting for age, sex, years in practice, practice type, and EUS availability. All analyses were performed using the Statistical Package for the Social Science (SPSS, version

Table 1. Professional characteristics of respondents

Credentialed by the Korean Board of Gastrointestinal Endoscopy, n (%)	
Yes	115 (53.7%)
No	99 (46.3%)
Type of practice, n (%)	
Academic practice	142 (66.4%)
General hospital	60 (28%)
Private office	10 (4.7%)
Health center	2 (0.9%)
Years in practice (Mean±SD)	5.7±5.4 years
Specialty, n (%)	
Internal medicine	208 (97.2%)
Pediatrics	0
General surgery	5 (2.3%)
Others	1 (0.5%)
EUS available within current practice, n (%)	
Yes	172 (80.4%)
No	42 (19.6%)

EUS: endoscopic ultrasound

12.0, Chicago, IL). p-values <0.05 were considered to indicate statistical significance of the tests.

RESULTS

Professional characteristics

In total, 661 surveys were distributed. We analyzed the data of 214 (32.4%) questionnaires with complete responses. The mean age of the study subjects was 37.9 ± 5.8 years, and 154 (72%) of the respondents were male. Data that showed the practices of responders are presented in Table 1. Half of the respondents (115, 53.7%) possessed the KBGE credential, and most participants (142, 66.4%) practiced in an academic setting. Overall, 172/214 (80.4%) of the respondents had EUS available at their institutions.

We found no significant differences in the specialties of respondents with and without the KBGE credential. However, significant differences in age, years in practice, practice types, and EUS availability were observed between respondents with and without the KBGE credential (Table 2).

Opinions about the need for EUS to assess gastrointestinal diseases

The opinions of respondents on the need for EUS in the evaluation of gastrointestinal diseases are presented in

Table 2. Comparisons between respondents with and without the Korean Board of Gastrointestinal Endoscopy credential

	Respondents with credential (n=115)	Respondents without credential (n=99)	P value
Mean age (years±SD)	40.8±5.8	34.5±3.6	<0.0001†
Years in practice (years)	8.6±5.7	2.2±2.2	<0.0001†
Sex, n (%)			0.0119‡
Male	91 (79.1)	63 (63.6)	
Female	24 (20.9)	36 (36.4)	
Practice type, n (%)			0.0001¶
Academic	62 (53.9)	80 (80.8)	
General hospital	44 (38.3)	16 (16.2)	
Private clinic	8 (7.0)	2 (2.0)	
Health promotion center	1 (0.9)	1 (1.0)	
Specialty, n (%)			0.5085¶
Internal medicine	113 (98.3)	95 (96.0)	
General surgery	2 (1.7)	3 (3.0)	
Other	0 (0.0)	1 (1.0)	
EUS availability, n (%)			0.0036‡
Yes	84 (73.0)	88 (88.9)	
No	31 (27.0)	11 (11.1)	

†,Student's t-test.
‡,chi-square test.
¶Fisher's exact test.
EUS: endoscopic ultrasound

Table 3. The following percentages of respondents believed that EUS is necessary for the evaluation of the selected GI diseases; SET, 94.9%; EEC, 88.8%; EGC, 86%; PC, 84.1%; ERC, 83.6%; GB polyp, 73.4%; AEC, 47.7%; CC, 32.2%; AGC, 31.8%; and ARC, 28.5%. The figure compares positive opinions on the need for EUS for early versus advanced cancers in each organ/location (Figure 1). Significant differences in opinions were observed among the responses to early and advanced hollow viscus cancers.

Table 4 shows the differences between respondents with and without the KBGE credential with respect to the perceived need for EUS. We found no significant differences between these groups in terms of positive opinions on EUS use for various diseases.

Perceived barriers toward common use of EUS

The most commonly cited barrier to more general use of EUS was lack of experienced endosonographers (66.2%); it was

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Table 3. Overall opinions about the need for EUS for GI diseases

	Strongly disagree n (%)	Disagree n (%)	Undecided n (%)	Agree n (%)	Strongly agree n (%)
EEC	0	2 (0.9%)	22 (10.3%)	108 (50.5%)	82 (38.3%)
AEC	6 (2.8%)	39 (18.2%)	67 (31.3%)	72 (33.6%)	30 (14%)
EGC	0	5 (2.3%)	25 (11.7%)	94 (43.9%)	90 (42.1%)
AGC	11 (5.1%)	60 (28%)	75 (35%)	50 (23.4%)	18 (8.4%)
PC	0	5 (2.3%)	29 (13.6%)	104 (48.6%)	76 (35.5%)
GB polyp	0	11 (5.1%)	46 (21.5%)	100 (46.7%)	57 (26.6%)
CC	3 (1.4%)	51 (23.8%)	91 (42.5%)	49 (22.9%)	20 (9.3%)
ERC	1 (0.5%)	7 (3.3%)	27 (12.6%)	116 (54.2%)	63 (29.4%)
ARC	12 (5.6%)	56 (26.2%)	85 (39.7%)	41 (19.2%)	20 (9.3%)
SET	0	2 (0.9%)	9 (4.2%)	87 (40.7%)	116 (54.2%)

AEC: advanced esophageal cancer; AGC: advanced gastric cancer; ARC: advanced rectal cancer; CC: colon cancer; EEC: early esophageal cancer; EGC: early gastric cancer; ERC: early rectal cancer; GB: gallbladder polyp; SET: subepithelial tumor; PC: pancreatic cancer

Table 4. Comparisons between respondents with and without the Korean Board of Gastrointestinal Endoscopy credential regarding positive opinions about the need for EUS

	Respondents with credential n (%)	Respondents without credential n (%)	P-value†	P-value‡
EEC	102 (88.7)	88 (88.9)	0.9644	0.8754
AEC	53 (46.1)	49 (49.5)	0.6187	0.5405
EGC	100 (87.0)	84 (84.9)	0.6579	0.5704
AGC	32 (27.8)	36 (36.4)	0.1811	0.0538
PC	94 (81.7)	86 (86.9)	0.3061	0.6376
GB polyp	82 (71.3)	75 (75.8)	0.4625	0.5045
CC	32 (27.8)	37 (37.4)	0.1362	0.2051
ERC	98 (85.2)	81 (81.8)	0.5026	0.7174
ARC	31 (27.0)	30 (30.3)	0.5887	0.1477
SET	111 (96.5)	92 (92.9)	0.2354	0.2044

†,chi-square test

‡,logistic regression, adjusted for age, sex, years in practice, practice type, and EUS availability

AEC: advanced esophageal cancer; AGC: advanced gastric cancer; ARC: advanced rectal cancer; CC: colon cancer; EEC: early esophageal cancer; EGC: early gastric cancer; ERC: early rectal cancer; GB: gallbladder polyp; SET: subepithelial tumor; PC: pancreatic cancer

followed by the high cost of equipment (53.1%), the cost of the procedure (33.3%), lack of availability (23.5%), unproven efficacy (7.5%), and the invasiveness of the procedure (6.6%). Eleven respondents (5.2%) also noted that improved magnetic resonance imaging (MRI)/computed tomography (CT) examinations were a barrier to the wider use of EUS.

Sources of information on EUS

The most commonly cited source of information on EUS was the internet (84%); this was followed by journals (67%), international EUS textbooks (64.6%), educational programs offered by their practice/hospital (59.4%), seminars or symposia sponsored by the KSGE (51.9%), and Korean EUS textbooks (46.2%).

DISCUSSION

To our knowledge, this is the first Asian study that addresses attitudes toward the use of EUS to evaluate various gastrointestinal diseases. Most respondents believed that EUS is necessary for the evaluation of early cancer (including EEC, EGC, and ERC) as opposed to advanced cancer (including AEC, AGC, and ARC). We found no differences in the opinions of those with and without the KBGE credential.

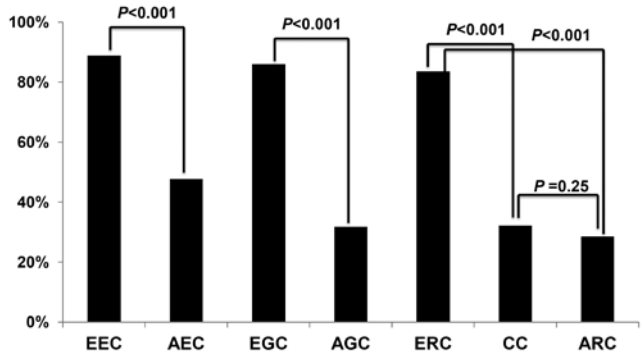

Figure 1. Comparisons of positive opinions about the need for EUS for early versus advanced cancers of each hollow viscus

It is proven that most Korean endoscopists favor the use of EUS for the assessment of early cancer. The incidence of gastrointestinal diseases is different in Western and Eastern countries. In addition, endoscopy is widely used for screening gastric cancer, even in individuals without symptoms, in Eastern countries, including South Korea and Japan (4,5). In addition, endoscopic resection is now used more and more for the treatment of EEC, EGC, and ERC in South Korea and Japan. It seems that EUS is regarded as a useful tool for determining whether patients with EEC (6), EGC (7), or ERC (8) are appropriate candidates for endoscopic resection by Korean endoscopists. However, relatively few respondents had positive opinions on the usefulness of EUS for advanced cancers of a hollow viscus (AEC 47.7%, AGC 31.8%, and ARC 28.5%). According to a survey conducted in the US about the usefulness of EUS for the clinical management of gastrointestinal malignancies, 71%, 41%, and 67% of the respondents found EUS to be useful for esophageal cancer, gastric cancer, and rectal cancer, respectively (1). Since that study did not separate early from advanced cancers, we were not directly able to compare the opinions of Western and South Korean endoscopists. CT/MRI techniques have been disseminated very rapidly in South Korea (9), and the number of CTs per 1 million residents of South Korea is more than double the OECD (Organization for Economic Co-operation and Development) average. Indeed, nine MRIs were available for every 1 million residents of South Korea in 2002, whereas that of the OECD average was 6.8. Recent advances in CT/MRI techniques can provide more comprehensive information regarding gastrointestinal diseases (10). Thus, we believe that low positive responses toward the usefulness of EUS may be due to the easy access to and the more advanced techniques of CT/MRI examinations in South Korea.

Endoscopic ultrasound is essential for the evaluation and treatment of SET (11). The rate at which gastric SET is identified during routine endoscopies is uncertain, although one retrospective Western study reported a prevalence of 0.36% during upper endoscopies (12). The rate at which SET is identified during this procedure is expected to be higher in South Korea than in Western countries due to the active endoscopic screening for gastric cancer in the former. Indeed, South Korean endoscopists have been publishing an increasing number of papers about the endoscopic treatment of SET (13,14). If the size of gastric SET is more than 2 cm, CT (preferably with contrast medium and slices less than 7 mm in thickness) is recommended for the assessment (15). However, CT/MRI can not identify the histological layers of the gut or small SET, limiting the value of CT/MRI in the assessment of SET (16). Overall, we assumed that most South Korean endoscopists would favor EUS in the evaluation of SET.

Many different imaging techniques are currently available, and EUS is just one of the feasible examination tools that a clinician can perform for pancreatic cancer (17). However, EUS is superior to other imaging modalities, especially for small tumors (<2 cm) and offers the possibility of performing fine-needle aspiration during the same procedure (17). The higher rate at which South Korean endoscopists perceive the need for EUS for pancreatic cancer may be related to these advantages of EUS.

Interestingly, nearly three-quarters (73.4%) of our responders believed that EUS is necessary for the assessment of GB polyps. The prevalence of obesity in South Korean adults has increased markedly due to the adoption of a Western lifestyle (18), and obesity is a risk factor for GB cancer (19). In particular, GB polyps sized >1 cm carry a higher risk of malignancy (20). With the increasing use of abdominal ultrasonography (US) in modern clinical practice, increasing numbers of GB polyps are being detected (20). However, EUS is superior to US for biliary imaging and has higher resolution, even for small GB polyps (21). Since obesity leads to limited image quality and potential operator difficulties with patient access and positioning during US examinations, US scanning can be difficult and, on some occasions, may be severely challenging (22). Thus, it is thought that many South Korean endoscopists favor the use of EUS for the assessment of GB polyps.

Our data indicate that the most common barrier to expanded implementation of EUS is lack of experienced endosonographers. This result is consistent with those of Western surveys that have also reported that a shortage of endosonographers is the main barrier to wider use of EUS (1, 2). Although the American Society for Gastrointestinal Endoscopy has published guidelines for training, credentialing, and granting privileges for EUS (23,24), this is not the case for KSGE or for many national associations of gastrointestinal endoscopy. Moreover, data that are focused on the amount and type of training needed are scarce (25,26). Nonetheless, education and training in EUS are not prerequisites for the KBGE credential in South Korea. There are limited opportunities in South

Korea for hands-on EUS training with animals. Given the sources of information on EUS cited in our study, most endoscopists are likely to be undertrained and, indeed, self-taught via the internet, journals, or international EUS textbooks. Thus, these training issues should be addressed to overcome this barrier to the common use of EUS.

Our study has several limitations, including selection bias, in that endoscopists who attended the 4th EndoFest in Korea may differ inherently from those who did not, and thus, our sample population may have been more likely to be knowledgeable on EUS. Additionally, this study is subject to information bias, in that endoscopists who are well versed in and supportive of EUS use may have been more likely to respond to this survey. However, the aforementioned issues would seem to be acceptable limitations in a study generating baseline data on opinions regarding the need for EUS use in the evaluation of gastrointestinal disease. When questioned about the need for EUS use in evaluating various GI diseases, we found no significant differences between endoscopists with and without the KBGE credential.

Our study was not intended to assess how EUS is used in the evaluation of different GI diseases. However, the perceived utility of EUS for the assessment of gastrointestinal diseases may be related to EUS utilization. Thus, we assumed that EUS may be used more frequently to evaluate SET, EEC, EGC, ERC, PC, and GB polyps than AEC, AGC, CC, and ARC in South Korea.

In conclusion, Korean endoscopists favor the use of EUS for the assessment of SET and early but not advanced cancers. The barriers to common use of EUS, according to Korean endoscopists, are similar to those reported by Western endoscopists.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of the Institutional Review Board of Catholic University of Daegu School of Medicine.

Informed Consent: Written informed consent was obtained from each respondent.

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