RESEARCH LETTER

Willingness to undergo screening gastroscopy in a population with low-to-moderate prevalence rate of esophageal and gastric cancer

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Introduction In 2020, gastric cancer ranked fifth in terms of incidence, and was the fourth leading cause of cancer-related death worldwide.[1] The most frequent type of gastric cancer is gastric adenocarcinoma (GA). According to a classification proposed by Lauren,[2] GA can be divided into 2 main histologic categories: intestinal and diffuse. Occurrence of the intestinal type is known to be preceded by precancerous conditions, such as atrophic gastritis (AG) and intestinal metaplasia (IM), leading to low- and high-grade dysplasia, and eventually to invasive adenocarcinoma.[3] Esophageal cancer ranked seventh in terms of incidence and sixth with respect to overall mortality in 2020. It is divided into 2 main subtypes, squamous cell carcinoma and esophageal adenocarcinoma (EAC), which have different etiologies.[1] EAC has been proven to develop from a premalignant condition called Barrett esophagus (BE). Because of its known pre-existing condition, EAC can potentially be prevented by screening esophagogastroduodenoscopy (EGD).[4] Across high-income countries, incidence rates of EAC are rising rapidly, partly because of the epidemic of obesity, gastroesophageal reflux disease, and BE.[5] Despite advances in diagnosis and therapy, the survival rate in patients with upper digestive tract cancers remains low, showing that improvement in early detection of dysplasia is needed. It is a crucial factor affecting survival, as endoscopic treatment of early lesions results in a reduction in mortality by 40%, whereas in advanced disease, the 5-year survival rate is 24% for gastric cancer.[6]

EGD is a procedure with a very low adverse event rate, mainly used for detecting premalignant lesions and cancers of the upper gastrointestinal tract.[7] Commonly, these pathologies do not cause clinical symptoms, and screening EGD may be the only way to detect them at an early stage. Recent studies have suggested that screening EGD might be effective in a population of Central European countries (eg, Poland) aged 40 to 69 years.[8] The purpose of screening EGD could be to search for precancerous conditions, namely, AG, IM, or BE. A potential obstacle to mass EGD screening could be willingness of patients to undergo this examination. In Western countries, screening gastroscopy programs have not been introduced to date; however, it has been demonstrated that cancer screening could be potentially cost-effective.[9] According to the European Society of Gastrointestinal Endoscopy (ESGE) position statement,[6] screening for upper gastrointestinal cancer is not currently recommended for intermediate-risk populations; however, it can be applied based on local conditions and availability of endoscopic resources.

The purpose of this study was to determine whether there is population-based acceptance of potential benefits and risks associated with screening EGD.

Patients and methods To assess potential willingness to undergo screening EGD, a simple online questionnaire was developed. The questionnaire was posted publicly on social media by all the researchers involved in this project, and was not published in closed groups. It was freely available to anyone who wished to complete and / or share it. To avoid significant bias, patients who presented for diagnostic endoscopic examinations or were hospitalized were not invited to complete the questionnaire.

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TABLE 1 Results of an online questionnaire evaluating patient willingness to undergo screening esophagogastroduodenoscopy

Acceptance ratio[a]	Age group, y								Total (n = 284)
	<40 (n = 41)	40–44 (n = 35)	45–49 (n = 69)	50–54 (n = 60)	55–59 (n = 37)	60–64 (n = 28)	65–69 (n = 8)	≥70 (n = 6)	
<10	15 (36.6)	7 (20)	22 (31.9)	15 (25)	11 (29.7)	11 (39.3)	3 (37.5)	3 (50)	87 (30.6)
10	7 (17.1)	8 (29.9)	19 (27.5)	16 (26.7)	10 (27)	6 (21.7)	1 (12.5)	2 (33.3)	69 (24.3)
100	12 (29.3)	7 (20)	14 (20.3)	11 (18.3)	7 (18.9)	2 (7.1)	3 (37.5)	0	56 (19.7)
1000	2 (4.9)	4 (11.4)	4 (5.8)	6 (10)	4 (10.8)	1 (3.6)	0	0	21 (7.4)
10 000	3 (7.3)	3 (8.6)	7 (10.1)	5 (8.3)	2 (5.4)	4 (14.3)	1 (12.5)	0	25 (8.8)
100 000	1 (2.4)	3 (8.6)	3 (4.3)	4 (6.7)	2 (5.4)	3 (10.7)	0	1 (16.7)	17 (6)
1 000 000	1 (2.4)	3 (8.6)	0	3 (5)	1 (2.7)	1 (3.6)	0	0	9 (3.2)

Data are presented as number (percentage) of patients.

a Acceptance ratio = ratio of potential benefits to a risk of complications

The collected data comprised age, sex, history of EGD, and subjective assessment of the acceptance index. The index was expressed as the ratio of potential benefits of a screening procedure (detection of a precancerous condition, such as BE or AG, resulting in inclusion in surveillance programs) to a risk of complications (including discomfort as well as serious adverse events). The benefits of screening EGD were defined in a previous publication.[8] The respondents were asked how many times the potential benefits would have to be greater than the risk of complications for them to undergo a screening examination. The respondents could choose from among numbers that are successive powers of 10 (1, 10, 100, 1 000, 10 000, 100 000, 1 000 000) or provide their own suggestion.

The study received approval of an ethics committee of the Medical University of Silesia (PCN/CBN/0052/KB/268/22). Informed consent to participate in the study was obtained from all individuals who completed the questionnaire.

Statistical analysis Continuous variables were presented as mean with SD, and ordinal variables as median with interquartile range (IQR). The responses in each age group were expressed as the number of observations and percentage. Difference in willingness to undergo EGD was assessed with the χ^2 test. *P* values lower than 0.05 were considered significant. The analysis was performed using SAS statistical package, version 9.4 (SAS Institute Inc., Cary, North Carolina, United States).

Results The online questionnaire was completed by 304 random individuals, 209 of whom were women (68.8%). The mean (SD) age of the respondents was 49 (9.5) years, and ranged between 22 and 76 years. A majority of the respondents were willing to undergo a screening procedure (n = 260 [85.5%]). A total of 162 individuals (53.3%) had not previously undergone EGD. Answer to the question regarding the acceptance ratio was provided by 284 respondents. The median acceptance ratio was 10 (IQR, 1–325). The most frequent answer was 10 (n = 69 [24.3%]) (TABLE 1). Median values for different age groups were as follows: 100 (IQR, 10–10 000; n = 35), 10 (IQR, 1–100; n = 69), 10 (IQR, 5.5–1000; n = 60), 10 (IQR, 1–100; n = 37), 10 (IQR, 1–5500; n = 28), and 10 (IQR, 1–100; n = 14) for individuals aged 40–44, 45–49, 50–54, 55–59, 60–64, and 65–69 years, respectively. Among the respondents who had not previously undergone EGD, 69.4% (124/162) wanted to undergo a screening procedure, while in the group of patients who had EGD before, 95.6% (136/142) were willing to have screening EGD performed (P <0.001).

Discussion The idea of screening for gastric cancer originated in Japan in the early 1960s.[10] Nowadays, a gastric cancer screening system is implemented only in high prevalence regions, defined as those with an age-standardized incidence rate greater than or equal to 20 per 100 000, such as Korea and Japan. In Europe, some regions present an intermediate risk, with a yearly incidence as high as 16 per 100 000.[11] A study conducted in Japan showed that implementation of EGD screening could be linked to a decrease in mortality rate from gastric cancer.[12] Korean studies also showed that gastric cancer mortality was lower in individuals undergoing screening gastroscopy than in those who were not screened.[13] Japanese guidelines suggest screening for gastric cancer should begin at the age of 50 years.[10] The ESGE recommends endoscopic surveillance every 3 years in patients with an increased risk of gastric cancer due to the presence of AG or IM on index gastroscopy. Such a surveillance strategy has been found cost-effective in individuals aged between 50 and 75 years, but it might apply to only 7% of the general population.[6] Recently, the idea of one-time screening EGD to identify patients with precancerous esophageal and gastric conditions has been proposed.[8] A potential obstacle to wide-range EGD screening may be willingness of the population to undergo this examination and accept the risk of harm. We previously showed that in a group of respondents aged 45 to 69 years, the estimated benefit-to-harm ratio

was 2.8 to 4.7 times higher than the level of acceptance obtained from all respondents.[8] The ratio was the highest in the age group of 45 to 50 years.

Screening colonoscopy is a widely accepted tool to reduce colorectal cancer (CRC) morbidity and mortality.[14] However, the effectiveness of CRC screening programs is strictly related to the number of patients presenting to the examination.[14] A randomized study conducted between 2009 and 2014 showed that in the Polish population, only 33% of participants were willing to undergo screening colonoscopy.[14] This result is significantly lower than the willingness rate reported in the current study. This is most likely because gastroscopy is an examination associated with easier preparation, shorter duration, and perhaps greater social acceptance. It is worth mentioning that a social campaign might potentially influence the willingness rate by reducing the fear of the procedure, as individuals who had previously undergone EGD were more likely to participate in a screening program. An additional benefit of screening EGD implementation could be a definitive diagnosis of *Helicobacter pylori* infection, as eradication of this bacterium is associated with a reduced incidence of gastric cancer.[15]

To conclude, screening EGD in a population with low-to-moderate cancer prevalence rate to identify high-risk groups, namely, individuals with AG and BE, could be potentially acceptable in age groups between 45 and 69 years.

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