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Letter to the Editor

The Agreement between Endoscopic and Histopathological Findings of Esophageal and Gastroduodenal Lesions and Its Relationship with Endoscopists' Experience

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Dear Editor,

Endoscopic and histopathological findings in diagnosing gastric diseases are complementary, and endoscopy alone cannot make a definitive pathognomonic diagnosis of gastric diseases.[1] In some cases, people with a normal endoscopy have abnormal histopathological findings, so combining endoscopic and histopathological findings is very useful for diagnosing precancerous gastric ulcers.[2]

As an early diagnosis reduces the disease's complications and the economic burden imposed on the country's healthcare system, studies on diagnosing gastrointestinal (GI) diseases via endoscopy are essential. Hence, we evaluated the agreement between abnormal endoscopic and histopathological findings of upper GI lesions and its relationship with the endoscopist's experience in adult patients referred to Afzalipour hospital in Kerman, Iran.

This cross-sectional, retrospective study was conducted from June 22, 2021, to August 23, 2021, in the Gastroenterology Department of Afzalipour hospital, affiliated with Kerman University of Medical Sciences, Kerman, Iran. The study population was patients who had undergone endoscopy and pathology sampling simultaneously. Inclusion criteria were age over 18 years and clarity of the final clinical diagnosis in the endoscopy report. Exclusion criteria were a previous definitive diagnosis of digestive problems or an incomplete clinical record. The gold standard for the final diagnosis of gastrointestinal lesions in our study was to perform a biopsy of the lesions. By referring to the hospital archives and carefully examining the patients' clinical records, upper endoscopy, and pathology results were recorded in separate checklists. After the checklists were filled, a gastroenterologist and a pathologist carefully checked all endoscopy and pathology reports to see whether they agreed with one another. They divided the cases into two groups: agreed and non-agreed.

In this study, 256 patients with a mean age of 51 ± 15 and an age range of 18-85 years participated. The largest number of endoscopies (38.3%) were performed by endoscopists with less than five years of experience. According to the type of endoscopic findings, erythematic and erogenous lesions (53.1%) were the most common. Regarding the site of involvement, the most frequent was the distal part of the stomach, i.e., incisura, antrum, prepyloric region, and pylorus (57.4%). Inflammation of the stomach and duodenum (gastritis) (82.4%) was the most common pathological finding (Table 1).

We found an agreement between endoscopic and pathological findings in 187 (73%) patients. There was no significant relationship between the endoscopists' experience and the agreement between endoscopic and pathological findings.

In terms of the type of endoscopic findings, the highest agreement was observed in gastric ulcers (81.7%), which was statistically significant ($P=0.005$), and the lowest agreement was observed in normal endoscopy reports (30.8%), which also was statistically significant ($P=0.001$). In terms of lesion location, the most and least agreement were seen in duodenal (81.3%) ($P=0.022$) and esophageal involvement (54.1%) ($P=0.005$), respectively (Table 2).

In this study, there was no significant difference in the average years of endoscopists' experience between the agreed findings group (12.2 ± 8.9) and the non-agreed findings group (11.9 ± 8.4).

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Table 1. Demographic findings of patients and frequency of location and type of endoscopic and pathologic findings

Variable	No. (%)
Gender	
Male	159 (62.1)
Female	97 (37.9)
Age group	
18-29	22 (8.6)
30-49	89 (34.8)
50-69	110 (43)
>70	35 (13.7)
Endoscopists' experience (years)	
<5	98 (38.3)
5-9	53 (20.7)
10-19	51 (19.9)
>20	54 (21.1)
Endoscopic findings	
Esophageal varices	21 (8.2)
Gastric varices	2 (0.8)
Hiatal hernia	29 (11.3)
Cancer	16 (6.3)
Ulcer	115 (44.9)
Erythema & erosion	136 (53.1)
Polyp	20 (7.8)
Atrophy	3 (1.2)
Normal	13 (5.1)
Location of endoscopic findings	
Esophagus	37 (14.5)
Fundus	37 (14.5)
Body	71 (27.7)
Incisura, antrum, prepyloric region, pylorus	147 (57.4)
Duodenum	96 (37.5)
Histopathological Findings	
Cancer	20 (7.8)
Ulcer	19 (7.4)
Metaplasia	41 (16)
Helicobacter pylori	86 (33.6)
Gastritis	211 (82.4)
Polyp	13 (5.1)
Dysplasia	8 (3.1)
Normal	7 (2.7)

Table 2. The agreement of endoscopy reports with pathology reports based on different components

Variable	Agreement		
	Yes, n (%)	No, n (%)	*P* value
Gender			
Male	115 (72.3)	44 (27.7)	0.740
Female	72 (74.2)	25 (25.8)	
Age group (years)			
18-29	15 (68.2)	7 (31.8)	0.215
30-49	71 (79.8)	18 (20.2)	
50-69	74 (67.3)	36 (32.7)	
>70	27 (77.1)	8 (22.9)	
Endoscopists' experience (years)			
<5	72 (73.5)	26 (26.5)	0.977
5-9	39 (73.6)	14 (26.4)	
10-19	36 (70.6)	15 (29.4)	
>20	40 (74.1)	14 (25.9)	
Endoscopic findings			
Cancer	12 (75)	4 (25)	0.856
Ulcer	94 (81.7)	21 (18.3)	0.005*
Erythema And Erosions	100 (73.5)	36 (26.5)	0.853
Polyp	13 (65)	7 (35)	0.398
Atrophy	1 (33.3)	2 (66.7)	0.178
Normal	4 (30.8)	9 (69.2)	0.001*
Location of endoscopic findings			
Esophagus	20 (54.1)	17 (45.9)	0.005*
Fundus	27 (73)	10 (27)	0.991
Body	57 (80.3)	14 (19.7)	0.106
Incisura, antrum, prepyloric region, pylorus	112 (76.2)	35 (23.8)	0.188
Duodenum	78 (81.3)	18 (18.7)	0.022*
Total	187 (73)	69 (27)	

*P value<0.05.

Regarding the type of endoscopic findings, the endoscopists' average years of experience were significantly higher in patients diagnosed with erythema and erosive lesions on endoscopy (13.8±9.4) than in patients without these lesions (10.1±7.4) (P=0.001).

Regarding the lesion location, the endoscopists' average years of experience were significantly higher in patients diagnosed with fundus lesions on endoscopy (17±10.5) than those without these lesions (11.3±8.1) (P=0.003). Similarly, the years of experience were higher in patients diagnosed with lesions in the body of the stomach on endoscopy (14.2±9.3) relative to patients without these lesions (11.3±8.3) (P=0.016) (Table 3).

In patients with abnormal findings, the sensitivity and specificity of endoscopy were 96.4% and 57.1%, respectively. Cohen's κ value for the statistical agreement was 0.37, considered low to moderate. In patients with cancer, the sensitivity and specificity of endoscopy were 60% and 98.3%, respectively; a good level of agreement was marked by a κ value of 0.64.

In this study, the highest number of endoscopies was in people 50 to 69 years old. Most guidelines recommend that people with dyspepsia without warning symptoms undergo endoscopy at the age of 60 years.[3] However, in Iran, due to the high prevalence of stomach cancer,[4] endoscopy and biopsy are recommended at a younger age.[5]

In many studies, the most reported pathology was gastritis (75.5%) ,[6] with our study showing that the prevalence of gastritis with and without *Helicobacter*

Table 3. Average years of endoscopists' experience according to location and type of endoscopic findings

Variable	Agreement, Y/N	Years, Mean ± SD	*P* value
Endoscopic findings			
Cancer	Y	14.2 ± 11.3	0.450
	N	12 ± 8.5	
Ulcer	Y	11.8 ± 8.4	0.592
	N	12.4 ± 8.9	
Erythema & erosions	Y	13.8 ± 9.4	0.001*
	N	10.1 ± 7.4	
Polyp	Y	14.2 ± 9.4	0.277
	N	11.9 ± 8.6	
Atrophy	Y	8.6 ± 5.5	0.489
	N	12.1 ± 8.7	
Normal	Y	10.1 ± 7.4	0.400
	N	12.2 ± 8.8	
Location of endoscopic findings			
Esophagus	Y	14.1 ± 10.6	0.201
	N	11.8 ± 8.3	
Fundus	Y	17 ± 10.5	0.003*
	N	11.3 ± 8.1	
Body	Y	14.2 ± 9.3	0.016*
	N	11.3 ± 8.3	
Incisura, antrum, prepyloric region, pylorus	Y	12.7 ± 8.8	0.240
	N	11.4 ± 8.6	
Duodenum	Y	11.3 ± 8.5	0.285
	N	12.6 ± 8.8	
Total	Y	12.2 ± 8.9	0.829
	N	11.9 ± 8.4	

*P value < 0.05; Y, Yes; N, No

pylori infection was 82.4%. Also, our highest frequency of endoscopic diagnosis was related to mucosal erythema and erosion (53.1%). In other studies,[7,8] the same lesions secondary to *H. pylori* infection or bile reflux have been reported as the most common endoscopic findings.[9]

In this study, the overall agreement of endoscopic diagnoses with the pathology reports was 73%. In some similar studies, the rate of endoscopic diagnosis in agreement with the pathology report was 79.5% in active gastritis[10] and 64.3% in *H. pylori* infection.[11] Of course, it should be mentioned that the optical diagnosis accuracy in colon lesions is much higher than in upper gastrointestinal lesions.[12]

Among the types of endoscopic diagnoses and their agreement with the pathology reports, only in peptic ulcers was there a statistical agreement between the endoscopy report and the diagnosis on pathology. Although it is often assumed that in large lesions such as cancer, there is a reasonable agreement between the endoscopy reports and the pathology reports, this agreement was not found in our study; of course, there was also no such agreement in the study reported by Sun et al.[13] In the study of Watanabe et al, there was a relationship between the endoscopists' experience and the diagnosis of *H. pylori* infection, and the greater the experience of the endoscopist, the greater the diagnostic accuracy.[14] In the study of Bustamante et al, there was a relationship between the endoscopists' experience and the diagnosis of gastric cancer.[15]

In our study, the lowest endoscopy-pathology agreement was in normal endoscopies. Hence, it can be concluded that a histopathological examination is necessary for symptomatic patients with normal endoscopy, irrespective of the endoscopists' experience.

In terms of the location of involvement and agreement between the endoscopy-pathology agreement, there was a significant agreement between the endoscopic diagnosis and the pathology results in duodenal lesions. According to the previous findings of this study about peptic ulcers, it can be concluded that duodenal ulcers have the highest diagnostic accuracy in endoscopy reports. The lowest agreement of endoscopic diagnosis with pathology reports was in esophageal lesions; for this reason, it can be recommended that a biopsy is necessary for all abnormal esophageal lesions.

In our study, regarding the different types of findings, there was a significant relationship between the average years of endoscopists' experience and mucosal erosion and erythema ($P = 0.001$). Although a similar study has not been done about such a relation, this issue is a sign that with increasing experience, the diagnostic accuracy for mucosal surface lesions increases, which shows the importance of experience in medicine.

Our study showed a significant relationship between the average years of endoscopists' experience and lesions of the fundus ($P = 0.003$) and body ($P = 0.016$) of the stomach. Fundus and body lesions may be missed due to the endoscopists' lack of focus or experience,[16] so less experienced gastroenterologists should be given sufficient training on accurately examining the fundus and body of the stomach. In our study, in patients with cancer, the sensitivity rate of endoscopic diagnosis was 60%, and the specificity rate was 98.3%. In the study by Kato et al, the sensitivity was 76.6%, and the specificity was 84.3%.[17]

Although we can rely on the endoscopists' experience to an acceptable extent in diagnosing duodenal ulcers and mucosal surface lesions in the body and fundus of the stomach, endoscopic observations alone are insufficient for the definitive diagnosis of most lesions. This study suggests that all the findings obtained from endoscopy, even by the most experienced endoscopists, should be combined with histopathological analysis to help diagnose GI diseases accurately.

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Authors' Contribution

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Competing Interests

The authors declare no conflict of interest related to this work.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical Approval

The study protocol was reviewed and approved by the Ethics Committee of Kerman University of Medical Sciences (IR.KMU.AH.REC.1400.027). We complied with the provisions of the *Declaration* of *Helsinki* in protecting the rights of patients under investigation.

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