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Prospective Study

Diagnosis of eosinophilic gastroenteritis is easily missed

Kodjo-Kunale Abassa, Xian-Yi Lin, Jie-Ying Xuan, Hao-Xiong Zhou, Yun-Wei Guo

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Abstract**AIM**

To analyze the clinical characteristics of eosinophilic gastroenteritis (EGE) and to investigate the situations of missed diagnosis of EGE.

METHODS

First, the clinical characteristics of 20 EGE patients who were treated at our hospital were retrospectively summarized. Second, 159 patients who underwent gastroscopy and 211 patients who underwent colonoscopy were enrolled. The pathological diagnosis showed only chronic inflammation in their medical records. The biopsy slides of these patients were reevaluated to determine the number of infiltrating eosinophils in order to assess the probability of a missed diagnosis of EGE. Finally, 122 patients who experienced refractory upper gastrointestinal symptoms for at least one month were recruited. At least 6 biopsy specimens were obtained by gastroscopy, and the number of eosinophils that had infiltrated was evaluated. Those who met the pathological diagnostic criteria of EGE underwent further examination to confirm the diagnosis of EGE. The probability of a missed diagnosis of EGE was prospectively investigated.

RESULTS

Among the 20 patients with EGE, mucosal EGE was found in 15 patients, muscular EGE was found in 3 patients and serosal EGE was found in 2 patients. Abdominal pain was the most common symptom. The number of peripheral blood eosinophils was elevated in all 20 patients, all of whom were sensitive to corticosteroids. Second, among the 159 patients who underwent gastroscopy, 7 (4.40%) patients met the criteria for pathological EGE (eosinophil count \geq 25/HPF). Among the 211 patients who underwent colonoscopy, 9 (4.27%) patients met the criteria for pathological EGE (eosinophil count \geq 30/HPF). No patients with eosinophil infiltration were diagnosed with EGE in clinical practice before or after endoscopy. Although these patients did not undergo further examination to exclude other diseases that can also lead to gastrointestinal eosinophil infiltration, these might be the cases where the diagnosis of EGE was missed. Finally, among the 122 patients with refractory upper gastrointestinal symptoms, eosinophil infiltration was seen in 7 patients (5.74%). The diagnosis of EGE was confirmed in all 7 patients after the exclusion of other diseases that can also lead to gastrointestinal eosinophil infiltration. A positive correlation was observed between the duration of the symptoms and the risk of EGE ($r = 0.18$, $P < 0.01$). The patients whose symptoms persisted longer than 6 mo more readily developed EGE. None of the patients were considered to have EGE by their physicians before endoscopy.

CONCLUSION

Although EGE is a rare inflammatory disorder, it is easily misdiagnosed. When a long history of abdominal symptoms fails to improve after conventional therapy, EGE should be considered.

Key words: Eosinophilic gastroenteritis; Missed diagnosis; Eosinophil; Gastroscopy; Colonoscopy

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Core tip: Eosinophilic gastroenteritis (EGE) is a rare but easily missed disorder. In our study, the biopsy slides from the patients who underwent gastroscopy or colonoscopy were reevaluated. We found that a diagnosis of EGE might have been missed in 4.40% (7/159) patients who underwent gastroscopy and in 4.27% (9/211) who underwent colonoscopy. Finally, a prospective study was performed and showed that in patients with refractory upper gastrointestinal symptoms, 5.74% (7/122) of patients represent a missed diagnosis of EGE. Therefore, physicians should increase their alertness and improve communication with pathologist to reduce the rate of missed diagnosis of EGE.

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INTRODUCTION

Eosinophilic gastroenteritis (EGE), which is a type of eosinophilic gastrointestinal disorder (EGID), is a rare chronic inflammatory disease characterized by patchy or diffuse infiltration of eosinophils into different layers of the gastrointestinal tract^[1-3]. Accurate epidemiologic data are lacking because most of the current studies are limited to small case series and single case reports. The incidence of EGE is estimated to be approximately 1-30/100000^[4-6]. Moreover, no effective consensus statement exists to guide clinical practice, and it is always a challenge for clinicians to diagnose EGE. Although recent studies and case reports have demonstrated that the incidence of EGE has been increasing, we believe that the incidence of EGE is underestimated.

Due to the non-specific nature of the symptoms of EGE, especially in those patients with mild symptoms, many clinicians seldom think of EGE unless these symptoms are refractory or elevated peripheral blood eosinophils are found. It is known that not all EGE patients present with an elevated level of peripheral blood eosinophils^[7-10], which might result in the missed diagnosis of some patients with normal counts of peripheral blood eosinophils. Furthermore, a definite diagnosis of EGE often relies on gastrointestinal endoscopy and histopathology, especially for the determination of the total number of infiltrating eosinophils per high power field^[11-15], but pathologists do not evaluate the exact number of infiltrating eosinophils unless the clinician has a special request to do so.

How many patients with EGE are there worldwide who are missed and how does this occur? Few studies have sought to answer this question. To improve clinicians' understanding of EGE and to increase its diagnosis rate, the clinical characteristics of patients with EGE who were treated at our hospital were retrospectively summarized. Then, patients who underwent gastroscopy and colonoscopy and whose pathological diagnosis showed only chronic inflammation in the medical records, were enrolled; the probability of a missed diagnosis of EGE was then retrospectively reviewed. Finally, patients with refractory upper gastrointestinal symptoms for at least one month were recruited, and the probability of a missed diagnosis of EGE was prospectively investigated.

MATERIALS AND METHODS

Patients and methods

Retrospective analysis of patients with EGE: All the patients diagnosed with EGE at our hospital from 2008 to 2015 with complete medical records were grouped together. The diagnosis and classification of EGE were performed according to Klein's criteria, as follows: the presence of gastrointestinal symptoms; pathological evidence of one or more areas infiltrated by eosinophils; other causes of eosinophilia were excluded^[16]. The age, gender distribution, symptoms, CRP, WBC, serum albumin, pathology report, Hp infection, treatment regimen, and response to treatment, among other parameters, were obtained and analyzed. The number of infiltrating eosinophils on the biopsy slide was recalculated.

The method of calculation of the number of infiltrating eosinophils was as follows: all biopsy samples were observed under the microscope with maximum magnification ($\times 400$) by specialists according to the "sweeping" technique, which consists of counting downward, then upward and finally from left to right. The mean number of eosinophils equaled the number of eosinophils counted in each field, divided by the number of fields present on the slide. Two specialists performed this analysis independently to calculate the mean value, which was the final number of infiltrating eosinophils. The pathological diagnostic criteria of EGID were as follows: esophagus, eosinophil count ≥ 15 /HPF; Stomach and duodenum, eosinophil count ≥ 25 /HPF; Colon and rectum, eosinophil count ≥ 30 /HPF^[17].

Retrospective study of cases of potential missed diagnosis: Patients who underwent gastroscopy from January 2014 to December 2014, and those who underwent colonoscopy from January 2010 to December 2014 at our hospital were enrolled.

Admission criteria: cases diagnosed as chronic mucosal inflammation after histopathologic study of a biopsy specimen obtained during gastroscopy or colonoscopy. Exclusion criteria: age < 18 years or ≥ 70 years; presence of ulcers, polyps, tumors, esophageal and gastric varices, portal hypertensive gastropathy, reflux esophagitis disease, or Barrett's esophagus observed during the endoscopy procedure; a history of gastrectomy or colectomy; previously diagnosed inflammatory bowel disease or autoimmune disease.

The biopsy slides of all the patients who met the criteria for this study were observed under a microscope, where the number of infiltrating eosinophils per high power field was obtained. Those who met the pathological diagnosis of EGE were selected and were analyzed statistically in terms of their age, sex, and results of a previous endoscopy report, among other characteristics.

Prospective study on eosinophilic gastroenteritis:

Patients who underwent gastroscopy in our Department of Endoscopy from August 2016 to December 2016 were enrolled. The admission criteria were as follows: patients with non-specific gastrointestinal symptoms such as abdominal pain, nausea, vomiting, dysphagia, dyspepsia, abdominal distension, unexplained weight loss, diarrhea for more than a month, and failure to respond to conventional treatments such as antacids, proton-pump inhibitors, and others for at least one week. The exclusion criteria were as follows: age < 18 years or ≥ 70 years; evidence or presence of tumors, esophageal varices, portal hypertension gastropathy, ulcers, reflux esophagitis disease, and polyps; a history of autoimmune disease, chronic liver diseases, severe diseases of the lung and cardiovascular system, diabetes mellitus, untreated coagulopathies, and chronic use of steroids, clopidogrel or aspirin; patients who refused or who were unable to give consent.

All the patients who fulfilled the criteria for the present study were classified into 3 groups according to the duration of their symptoms. Group one contained patients with symptoms that persisted for less than 3 mo, group two contained patients with symptoms that persisted between 3 mo and 6 mo, and group three contained patients whose symptoms persisted for more than 6 mo. All patients signed a written consent form before the procedure. A questionnaire that asked the name, age, sex, symptoms, and previous medical history was then completed and signed by the physician before gastroscopy was performed.

Among the patients who met the above criteria, biopsies were obtained from their antrum and duodenum (3 pieces from each site) for pathologic study, and the number of infiltrating eosinophils per high power field on each slide was calculated. Patients who met the requirements for the diagnosis of EGE by microscopy were classified as positive patients. To exclude other causes of eosinophilia of the gastrointestinal tract, the positive patients underwent examinations such as routine blood routine tests, routine stool tests, examination of the stool for ova and parasites, chest X-ray, abdominal ultrasound, anti-nuclear antibody (ANA), and detection of cancer markers, among other tests. A statistical analysis was then performed that included the age, sex, symptoms, laboratory examinations, treatment and follow-up protocol of the positive patients.

Statistical analysis

Statistical data were expressed as a mean \pm SD or as a percentage. A *t*-test was used to compare means of continuous variables between two groups. A χ^2 test was used to compare the constituent ratio of non-continuous variables between two groups. A Spearman correlation was used to study the correlation of non-continuous variables. All data analyses were performed

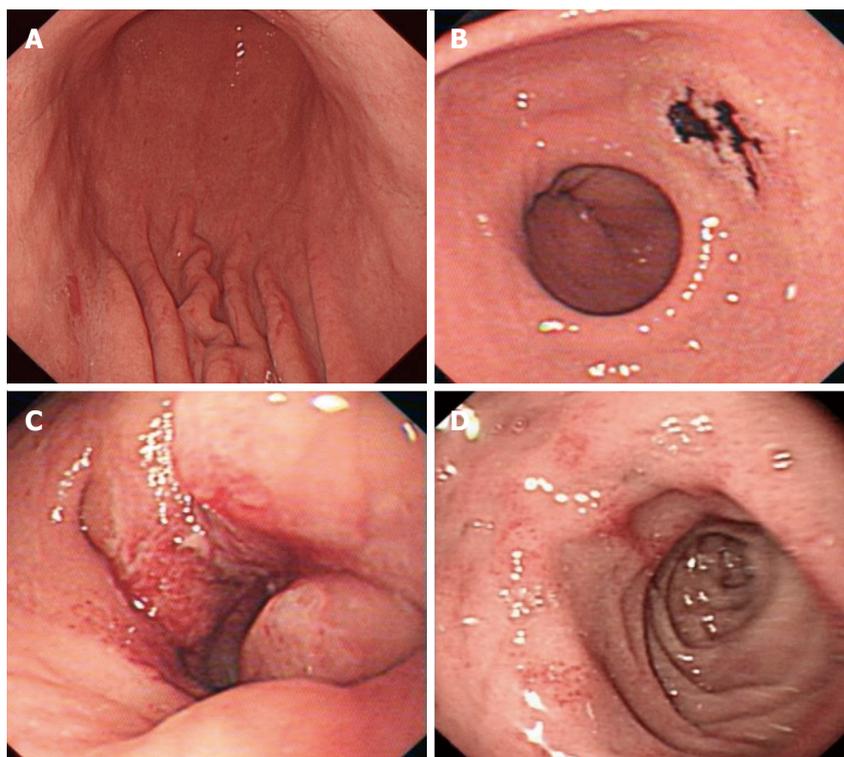


Figure 1 Endoscopic presentation of the eosinophilic gastroenteritis patients on gastroscopy. A: Mucosal edema and hyperemia of the greater curvature of stomach; B: Large sheet erosion in antrum; C: Pyloric stenosis with ulcers in duodenal bulb; D: Edema and hyperemia of the descending duodenum.

using SPSS 22.0. A statistical significance threshold of $P = 0.05$ was adopted.

RESULTS

Retrospective analysis of patients with EGE

From 2008 to 2015, 20 patients were diagnosed with EGE according to complete medical data obtained in our hospital; these patients included 8 males and 12 females, with a mean age of 46.1 ± 15.2 years. With respect to the affected layer, 15 patients were diagnosed with mucosal EGE, three patients were diagnosed with muscular EGE, and two patients were diagnosed with serosal EGE. The most common symptom was abdominal pain (70%), followed by abdominal distention (65%), nausea and vomiting (35%), and diarrhea (20%). The duration of symptoms of the 20 patients ranged from 2 wk to 6 years.

Elevated numbers of blood eosinophils were found in all 20 patients (100%), who had an average eosinophil count of $7.12 \pm 9.25 \times 10^9/L$, and 8 patients (40%) showed an elevated level of WBC with mean WBC count of $11.82 \pm 7.29 \times 10^9/L$. An elevated CRP level was detected in 7 patients (35%) and a low albumin level was detected in 5 patients (25%). All the patients underwent fecal testing for ova and parasites, ANA, X-ray, abdominal ultrasound or CT scan, to exclude all other causes of eosinophilia.

All patients underwent gastroscopy, but only ten underwent colonoscopy at the same time. The most common endoscopic presentation was mucosal edema

and hyperemia (100%), followed by mucosal erosion and hemorrhage; moreover, duodenal stenosis was found in two patients (Figure 1). Pathological infiltration of the esophagus by eosinophils was not observed in any of the 20 patients. Eosinophil infiltration was found in the antrum in 10 patients (50%) with a mean eosinophil count of $27.8 \pm 6.9/HPF$, and in the duodenum in 13 patients (65%) with a mean eosinophil count of $29.8 \pm 6.6/HPF$. Among the 10 patients who underwent colonoscopy, the most common endoscopic presentations were mucosal congestion, edema, and spotty or segmental mucosal erosion. Superficial ulcers were observed in one patient (Figure 2). Eosinophil infiltration was found in the distal ileum in 6 patients (60%) with a mean eosinophil count of $30.4 \pm 35.4/HPF$; eosinophil infiltration in the colon was observed in 2 patients (20%) with a mean eosinophil count of $35.2 \pm 12.4/HPF$. None of the patients exhibited eosinophil infiltration in the rectum. A large number of eosinophils were observed in ascites of two patients (Figure 3).

All patients received corticosteroid treatment, which consisted of oral prednisone at an initial dose of 30-45 mg/d or intravenous dexamethasone at an initial dose of 5-10 mg/d. Within 5 to 7 d, all 20 patients reported complete remission of symptoms. After 7-8 d of treatment, abdominal ultrasound confirmed the absence of ascites in two patients with serosal EGE. The duration of corticosteroid treatment was 21.3 ± 13.7 d. Other treatments included dietary restrictions, proton pump inhibitors, mucosal protective agents, antispasmodics, as well as antidiarrheal and

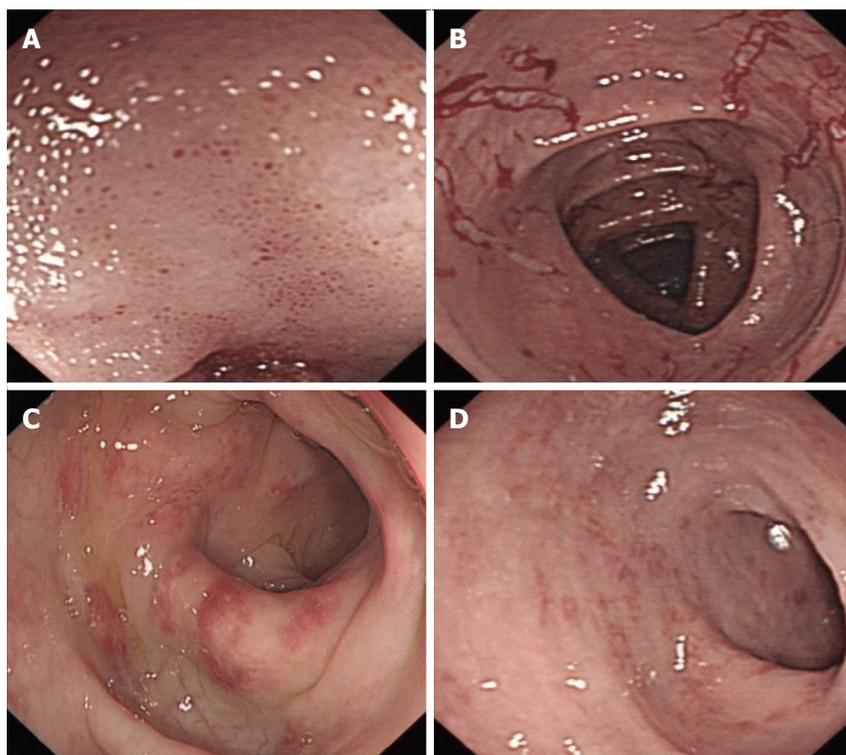


Figure 2 Endoscopic presentation of the eosinophilic gastroenteritis patients on colonoscopy. A: Mucosal edema and small hemorrhagic spot in the distal ileum; B: Mucosal edema and erosions in the transverse colon; C: Segmental erythematous edema and hyperemia in the descending colon; D: Erythematous edema and hyperemia in the sigmoid colon.

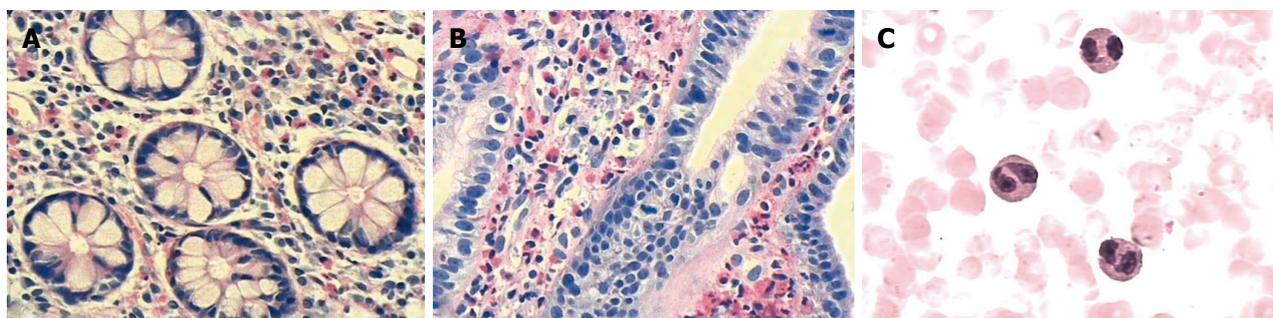


Figure 3 Pathology presentation of biopsy specimens from eosinophilic gastroenteritis patients (HE stain $\times 400$). A: Massive infiltration of eosinophils in the gastric mucosa of an eosinophilic gastroenteritis (EGE) patient; B: Massive infiltration of eosinophils in the colonic mucosa of an EGE patient; C: Massive infiltration of eosinophils in the ascites fluid of an EGE patient.

antianaphylaxis agents. After 2 years of follow-up, the symptoms of two patients (in the muscular group) recurred, and these patients were readmitted to the hospital for another steroid regimen, which was able to control the symptoms.

Retrospective study of cases of potential missed diagnosis

According to the admission and exclusion criteria, data from a total of 159 patients who underwent gastroscopy from January 2014 to December 2014 were collected. Among those patients, 7 patients (4.4%) met the criteria of the pathological requirement for the diagnosis of EGE by microscopy (eosinophil count ≥ 25 /HPF). Among these 7 patients, 5 were male and 2

were female, and the mean age was 40.0 ± 14.1 years. According to the admission and exclusion criteria, data from 211 patients who underwent colonoscopy from January 2010 to December 2014 were collected. Among those patients, 9 patients (4.26%) met the criteria for the pathological requirement for the diagnosis of EGE by microscopy (eosinophil count ≥ 30 /HPF). Among these 9 patients, 4 were male and 5 were female, and the mean age was 40.0 ± 14.1 years.

According to the medical records, all 7 patients who underwent gastroscopy and the 9 patients who underwent colonoscopy were not considered to have EGE in clinical practice before or after endoscopy. They were simply diagnosed with "chronic gastritis" or "non-specific enteritis", and because of this, the

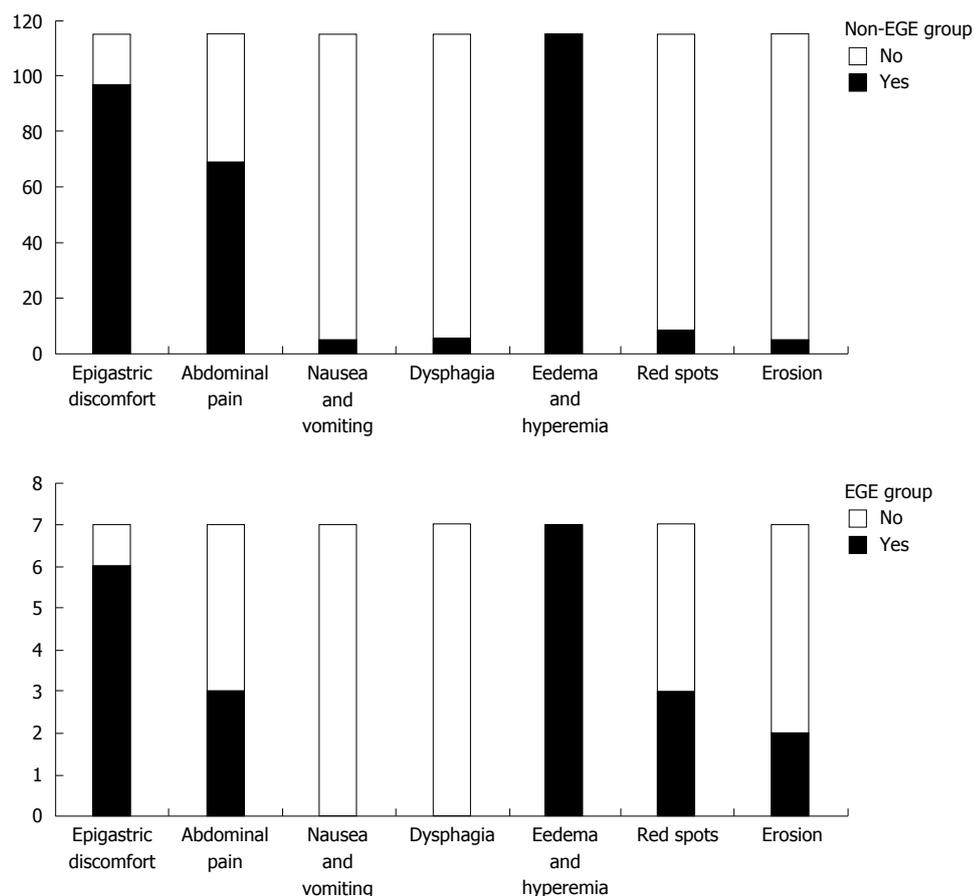


Figure 4 Clinical and endoscopic presentation of eosinophilic gastroenteritis and non- eosinophilic gastroenteritis patients. No statistical significance was shown between eosinophilic gastroenteritis (EGE) and non-EGE patients in terms of clinical and endoscopic presentation (all $P < 0.05$).

number of infiltrating eosinophils per high power field was not obtained. Although these patients did not undergo further examination to exclude other diseases that may also lead to gastrointestinal infiltration by eosinophils, they might represent the cases in which a diagnosis of EGE might have been missed.

Prospective study on eosinophilic gastroenteritis

Patients admitted to the study were all from an outpatient department (OPD) and were therefore in a relatively stable general condition. Their OPD files showed that their physicians did not consider the possibility of EGE in the differential diagnoses. Most of the diagnoses and treatments were directed toward gastritis and gastroesophageal reflux disease, among others.

A total of 122 patients, including 59 males (48.4%) and 63 females (51.6%) with a mean age of 38.3 ± 12.2 years, met the criteria of this study. Among the 122 patients, 7 (5.74%) met the pathological diagnostic criteria of EGE. The diagnosis of EGE was confirmed in all 7 patients through the exclusion of other diseases that can also lead to gastrointestinal eosinophil infiltration. Two out of the 122 (1.64%) patients had a history of allergy, one from the EGE group ($n = 7$) and the other from the non-EGE group

(those who didn't meet the diagnostic criteria of EGE, $n = 115$).

Among all recruited patients, the common clinical presentations included epigastric discomfort (84.4%), abdominal pain (59%), dysphagia (4.9%), nausea and vomiting (4.1%). No difference was observed between the EGE and non-EGE groups in terms of clinical presentation (all $P > 0.05$) (Figure 4). According to the duration of the symptoms, the 122 patients were divided into three groups. Among the 27 patients whose symptoms persisted for less than 3 mo, no EGE was observed. Among the 60 patients whose symptoms persisted between 3 and 6 mo, 2 EGE cases were observed. Among the 35 patients whose symptoms persisted longer than 6 mo, 5 EGE cases were observed. A Spearman correlation analysis revealed a positive correlation between the duration of symptoms of the patients and the probability of the development of EGE ($r = 0.209$, $P < 0.05$).

All 7 patients in the EGE group underwent further laboratory examination to exclude other causes of eosinophilia. The mean blood WBC of the 7 patients was $4.97 \pm 1.66 \times 10^9/L$ and only 2 patients (28.6%) showed elevated blood eosinophils with a mean count of $0.46 \pm 0.39 \times 10^9/L$. No abnormal result was noted in terms of stool parasites, ANA, cancer markers, X-ray,

abdominal ultrasound or CT scan.

Eosinophil infiltration was found in the duodenal biopsies of all 7 patients with EGE (mean value of $34.7 \pm 6.7/\text{HPF}$) and in the antral biopsies of 2 patients with EGE (mean value of $26.0 \pm 1.4/\text{HPF}$). Positive *Helicobacter pylori* infection was detected in 17 patients (14.8%) in the non-EGE group and in 2 patients (28.6%) in the EGE group, but these differences were not statistically significant ($\chi^2 = 0.954$, $P > 0.05$). The common endoscopic presentations were mucosal edema and hyperemia, red spots, and erosion in all 122 patients. No difference was observed between the EGE and non-EGE groups in terms of endoscopic presentation (all $P > 0.05$) (Figure 4).

All 7 patients with EGE received oral prednisone treatment at an initial dose of 30-40 mg/d, combined with dietary restrictions, proton-pump inhibitors or mucosal protective agents. After a week of treatment, all the patients noticed a remarkable improvement in their symptoms. The dosage of prednisone was gradually decreased to 5-10 mg/d. The complete treatment course varied from 4 and 12 wk. A follow-up of all 7 patients revealed that, to date, none of them complained of symptom relapse.

DISCUSSION

Eosinophilic gastrointestinal disorder (EGID) was first described by Kaijer in 1937^[18] and is characterized by infiltration of eosinophils into different layers of the gastrointestinal tract in the absence of secondary causes. EGID primarily involves eosinophilic esophagitis (EoE) and eosinophilic gastroenteritis (EGE). In Asian patients, EGE occurs more frequently than EoE compared with Caucasian patients^[19].

According to previous studies, the incidence of EGE is estimated to be approximately 1-30/100000^[4-6]. Recent studies and case reports have demonstrated that this incidence has been increasing. In their study, Reed *et al*^[20] revealed that among all the biopsies obtained through upper endoscopy at their center, 0.67% of them met the criteria for EGE. This indicates that EGE is not as rare as previously thought. The percentage of missed diagnoses of EGE may be very high. Our retrospective study revealed the possibility that 4.26% of cases were missed diagnoses of EGE in patients whose gastroscopy and histopathology results showed only chronic inflammation. Our study also revealed the possibility that 4.40% of cases were missed diagnoses of EGE in patients whose colonoscopy and histopathology results showed only chronic inflammation. The prospective study revealed that 5.74% of patients with chronic refractory upper gastrointestinal symptoms might represent cases where the diagnosis of EGE was missed. Thus, we believe that the incidence of EGD is underestimated, not only because the incidence of EGD itself is on the rise but also because it is easy for a diagnosis of EGE to be missed in clinical practice.

In terms of the reasons for the missed diagnosis of EGE, we consider the non-specificity of EGE symptoms and endoscopic presentations, insufficient understanding of EGE, and poor communication between clinicians and pathologists, among other reasons. The clinical presentations of EGE greatly depend on the site and depth of infiltration of eosinophils. The most common clinical presentations are abdominal pain, nausea, vomiting, diarrhea, weight loss, abdominal distention, dysphagia, and in some cases, gastrointestinal bleeding^[2-4]. Most EGE patients do not exhibit any specific symptoms, and this number may be as high as 80% of all EGE patients^[21]. As shown in our study, these patients always present with abdominal pain, epigastric discomfort, abdominal distention, nausea and vomiting, and diarrhea, among other symptoms. With the exception of those who present with some "severe" symptoms or signs such as weight loss, gastrointestinal bleeding, anemia, pyloric stenosis, intestinal obstruction, or ascites, patients are always diagnosed with "gastritis" or "non-specific enteritis". Even in those patients assigned to undergo endoscopy, their endoscopic presentations also lack specificity. The endoscopic presentations primarily present as mucosal hyperemia, edema, hemorrhage, erosions, and ulcers^[9,22,23]. If a clinician does not consider EGE and if eosinophils are not detected in blood and biopsy samples, EGE is very easily missed.

An increase in the level of peripheral eosinophils is an important factor in the diagnosis of EGE^[24]. It is known that not all EGE patients present an elevated level of peripheral blood eosinophils^[25,26]. Present studies have revealed that approximately 70%-90% of EGE patients have elevated peripheral eosinophil counts^[7-10]. According to our retrospective study, all 20 EGE patients exhibited an elevated peripheral eosinophil count, whereas in our prospective study, only 2 out of 7 patients diagnosed with EGE showed an elevated peripheral eosinophil count. Thus, the high level of peripheral eosinophils is very important in the diagnosis of EGE, but it is not mandatory. Waiting to observe an increase in the peripheral eosinophil count before considering EGE is a huge mistake, which commonly leads to missed diagnoses and unnecessary medical tests. Although our prospective study contained a relatively small number of samples, we observed milder clinical and endoscopic presentations in those 7 patients compared with the 20 patients in the retrospective study. Therefore, we believe that a missed diagnosis of EGE occurs more easily in patients with mild presentations and those with a better overall condition.

Since a normal level of peripheral eosinophils is seen in some patients with EGE, evidence of one or more areas infiltrated by eosinophils is more reliable and necessary for a diagnosis. Unlike the esophagus, the healthy gastrointestinal tract normally contains a certain number of eosinophils. Therefore, various studies have established the number of infiltrating

eosinophils as an indication of pathological infiltration at deferent levels^[7,12-13,25]. The stomach and small intestine, especially the antrum and the duodenum, are the most affected sites in EGE, which was also confirmed in our retrospective analysis of EGE patients. For this reason, we selected the antrum and the duodenum as the sites for biopsy in the prospective study. At the same time, it is necessary to obtain at least 5-6 biopsy specimens in order to improve the positive detection of eosinophil infiltration^[11,14]. One study asserted that nearly 50% of EGE patients exhibited the abnormal presence of eosinophils in the colon and rectum^[8]. Therefore, for highly suspected patients with negative founding by gastroscopy, a colonoscopy is necessary to acquire evidence of EGE. Furthermore, in some cases a repeat endoscopy may be useful. More importantly, as pathologists do not routinely calculate the number of eosinophils on biopsy slides, a special reminder should be sent to pathologists once EGE is suspected.

Diet control and corticosteroids are the main treatments for patients with EGE^[27-30]. For patients in whom diet-induced EGE is suspected and in those with a prior history of allergy, EGE can be managed *via* the sequential elimination of possible food allergens. Corticosteroids are the primary treatment modality for patients with EGE. The starting dose is 15-40 mg/d of oral prednisone and 40 mg/d of methylprednisolone infusion in more severe cases. The dosage is then slowly decreased until complete cessation, but this is dependent on the different response of patients. In cases of relapse of the disease, which occur while the dosage of steroids is decreased, it is recommended that the dose be increased and that the treatment time be extended. It is not uncommon for the disease to relapse once the steroid treatment ceases. It is advisable to treat the patient again with the same regimen for a longer duration. However, to date, no standard length of the treatment duration has been established for EGE. In the present study, all patients with EGE were sensitive to prednisone.

Of course, the present study has some limitations that should be mentioned. In the retrospective analysis of patients with EGE, only the patients with complete data were included. Those with incomplete data who were diagnosed with EGE were not enrolled. This increased the gap between the actual number of EGE patients and those considered in this study. In the retrospective study on possible cases of missed diagnosis, because clinicians did not consider the probability of EGE as a diagnosis, these patients did not undergo a full workup to exclude other causes of eosinophil infiltration. Thus, this portion of the study can only give a possibility of diagnosis and not a confirmation of EGE. This study is a single-center study that was performed over a relatively short period of time with a relatively small number of samples, especially the prospective study. Therefore, the results obtained in this study require further investigation.

In conclusion, eosinophilic gastroenteritis is a relatively rare chronic inflammatory disease, but we have underestimated its incidence. Since the clinical presentation of EGE lacks specificity, patients with symptoms of chronic gastritis that fail to improve after repeated treatments should undergo examinations such as endoscopy and histopathology to exclude EGE. The longer these symptoms persist, the more likely the person has EGE. Peripheral blood hypereosinophilia is not mandatory for the diagnosis of EGE, and a multiple-site biopsy and an eosinophil count under a microscope are more important. Good communication among clinicians, endoscopists and pathologists can help decrease the rate of missed diagnosis of this disease.

COMMENTS

Background

Eosinophilic gastroenteritis (EGE) is a rare chronic inflammatory disease. Due to the non-specific nature of the symptoms of EGE and no effective consensus statement exists to guide clinical practice, EGE always a challenge for clinicians to diagnose EGE. This study was designed to explore the clinical characteristics of EGE and the situations of missed diagnosis of EGE.

Research frontiers

Because the diagnosis of EGE is easily missed, many current researchers mainly focus on how to increase diagnostic efficiency of EGE. It is rare for research to investigate how many cases miss the diagnosis and analyze the reason.

Innovations and breakthroughs

The rate of missed diagnosis of EGE is very high, especially in patients with refractory upper gastrointestinal symptoms. The longer these symptoms persist, the more likely the person has EGE. Peripheral blood hypereosinophilia is not mandatory for the diagnosis of EGE, and a multiple-site biopsy and an eosinophil count under a microscope are more important.

Applications

Clinicians should be aware of the possibility of EGE in the patients with refractory gastrointestinal symptoms. Good communication among clinicians, endoscopists and pathologists can help decrease the rate of missed diagnosis of this disease.

Terminology

PHG: portal hypertension gastropathy, is a gastric disorder associated with portal hypertension. The endoscopic appearance of gastric mucosa shows a characteristic mosaic-like pattern. The patient with PHG can present with abdominal pain, nausea, vomiting, dyspepsia, dominant or recessive upper gastrointestinal bleeding.

Peer-review

Very interesting work on a little discussed topic in the gastroenterology community. Given the rarity of the disease, it is not expected that both retrospective and prospective studies could have a large number of patients to allow definitive conclusions.

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