

Correlation Between Eosinophilic Gastroenteritis With Peripheral Eosinophilia: A Retrospective Study in a Tertiary Care Hospital

Satish Arakeri*, Geethavasu P.**, Arun Gopi***

*Assistant Professor **Professor, Department of Pathology ***Lecturer, Department of Preventive Medicine, DMWIMS Medical College, Naseera Nagar, Meppadi, Wayanad, Kerala-673577, India.

Abstract

Introduction: Eosinophilic gastroenteritis is a rare inflammatory condition characterized by increase in number of eosinophils. There are various causes enumerated to eosinophilic gastroenteritis includes H pylori infection, drugs, parasites, allergen. *Objective:* To find the correlation between eosinophilic gastroenteritis and peripheral blood eosinophilia. *Materials and Methods:* 85 cases are selected. The diagnostic criteria for eosinophilic gastroenteritis is presence of more than 30 eosinophils per high power field. The absolute eosinophil count of all the cases is noted. *Results:* Among 85 cases, 59 are males and 26 are females. The mean age of male and female patients included in this study is 51.31 years and 52.46 years respectively. The most common site involved is colon. Kappa (weighted) statistics shows 36% agreement. *Discussion:* Our study shows only 36% patients have raised absolute eosinophil count. *Conclusion:* Eosinophilic gastroenteritis is common in 5th decade, more common in male patients. Since only 36% of patients have raised absolute eosinophil count. Biopsy remains the gold standard modality of diagnosis.

Keywords: Allergy; Colon; Eosinophilia; Gastroenteritis.

Introduction

Eosinophils are the normal component of the peripheral blood. Its number is increased in various allergic conditions. These allergic conditions are easily diagnosed by doing blood absolute eosinophil count. Similar increase in number of eosinophils in biopsy of gastrointestinal tract is called as eosinophilic gastroenteritis. These patient will present with diarrhea, vomiting and abdominal pain. These are the symptoms most commonly misdiagnosed for other routine cases like gastroenteritis, peptic ulcer disease. Hence biopsy proven diagnosis is the sole modality of diagnosis of eosinophilic gastroenteritis. But in all the cases, endoscopy or colonoscopy cannot be done, as these procedures are invasive and admission required. Sometimes, these procedures have dreaded complications too. Since the pathology is associated with eosinophil, it is planned to conduct a research

study to find out whether the biopsy proven cases of eosinophilic gastroenteritis shows similar increase in number of eosinophils in the peripheral blood. This will help clinicians to diagnose these cases by doing the blood absolute eosinophil count and plan the treatment as per protocol. It is also helpful for the patients to avoid undergoing invasive procedures [1,2,3].

Material and Methods

The present study is a retrospective study conducted between 2013-2016 (3 years) in a tertiary care hospital. Total 85 cases of upper GI endoscopy and colonoscopy biopsies have been included in the study. The relevant data regarding patients have been collected from Hospital information system (HIS). The diagnostic criteria for eosinophilic gastroenteritis is the presence of more than 30 eosinophils per high power field. The normal absolute eosinophil count considered is 40 - 399/mm³. The values of absolute eosinophil count of patients is recorded from 5 part sysmex hematology analyzer machine. To reduce the

Corresponding Author: Satish Arakeri, Assistant Professor, Dept. of Pathology, DMWIMS Medical College, Naseera Nagar, Meppadi, Wayanad-673577 Kerala, India.
E-mail: drsatissharakeri@gmail.com

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bias, all the biopsy slides are examined by two pathologist. Hence fulfilling the criteria of double blind review of slides. Patients who are on steroids therapy in the last six months of diagnosis are excluded from the study.

Results

The present study includes 85 cases of eosinophilic gastroenteritis. Among 85 cases, 59 are males and 26 are females patients. The mean age wise distribution of male patients is 51.31±17.01 and for females 52.46±15.24 years

The most common site involved is colon.

The mean number of eosinophils in biopsy is 278.59 with standard deviation of 185.01. The mean number of eosinophils in blood is 275.46 with standard deviation of 443.99. With these data, the P value is 0.953. Mann-Whitney U test has been performed as the data was not normally distributed. A P value of 0.953 suggests that there is no statistically significant difference in the eosinophilic gastroenteritis and peripheral eosinophilia.

As per Kappa (weighted) statistics, there is 36% of agreement between the biopsy findings and peripheral blood eosinophil rise.

Table 1: The table shows age and gender wise distribution of cases

Gender	Age (Mean±SD) in years	Frequency	Percentage
Males	51.31±17.01	59	69%
Females	52.46±15.24	26	31%

Table 2: The table shows site wise distribution of cases

Site of involvement	Number of Cases	% of Total Cases
Stomach	11	13.0%
duodenum	07	8.2%
Ileum	07	8.2%
Colon	60	70.6%
Total cases	85	100%

Table 3: The Table shows mean, standard deviation of eosinophils with P value

	Mean	SD	P value
No of Eosinophils in biopsy	278.59	185.01	0.953
No of Eosinophils in blood	275.46	443.99	

Table 4: The Table shows data analysis by weighted Kappa statistic

		Blood eosinophils		Kappa
		Normal	Increased	
Biopsy	Normal	0	0	0.36
	Increased	62	23	

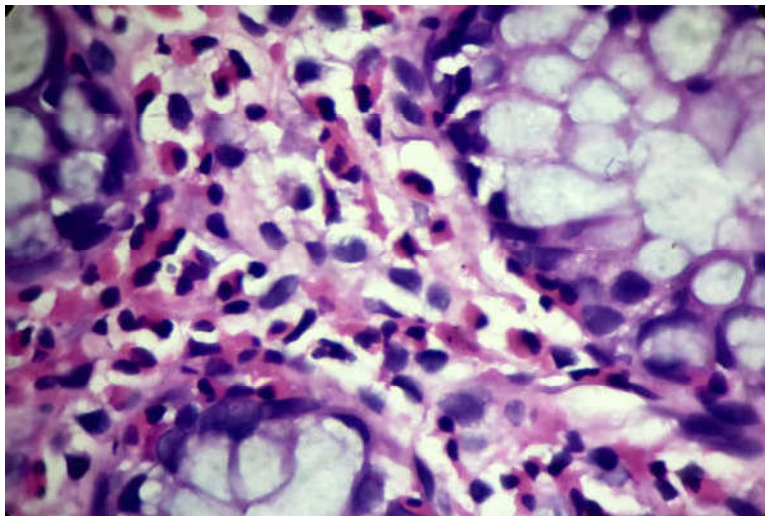


Image 1: The image shows increase in number of eosinophils in the lamina propria (40X, H& E stain)

Discussion

The eosinophil is a bilobed leukocyte with granules, which stain with acid dyes such as eosin. These granules contain many chemical mediators such as major basic protein (MBP), neuropeptide, peroxidase, platelet-activating factor, leukotrienes and substance P. Eosinophil is produced from its precursor in the bone marrow under the regulation of transcription factors GATA-1, GATA-2 and c/EBP. It will take 8 days to produce mature eosinophil in the bone marrow and spends 8-12 hours in the peripheral blood. Then relocates to tissue like gastrointestinal tract for one more week. Numerous chemical mediators play a vital role in the synthesis and migration of eosinophils. IL-3 and GM-CSF help in the synthesis of eosinophils in the bone marrow. IL-5 helps in the release of eosinophils into the peripheral blood. IL-1, IL-4, IL-13 and TNF- α help in the adhesion of eosinophil to the endothelium of the blood vessels. Platelet-activating factor, eotaxin-3 and Leukotriene C4 act as chemo attractant for the eosinophil. All these experiments were done on mice by injecting artificially synthesized chemical mediators by Hogan et al., Mattes et al [4,5].

Eosinophil, under normal condition, resides in the lamina propria of the gastrointestinal tract. Eosinophilic gastroenteritis is a condition characterized by increase in number of eosinophils in the wall of GI tract. Various etiological factor leads to eosinophilic gastroenteritis such as allergy, parasitic infestation, hypereosinophilic syndromes, Churg-Strauss syndrome, polyarteritis nodosa and H. Pylori infection [4,5].

Clinical manifestations thoroughly vary depending on their location within the gastrointestinal tract and depth of involvement of the intestinal wall. The most common symptoms are dysphagia, abdominal pain and diarrhea. Few patients have rare complications like stenosis, hemorrhage, ulcers and a wide range of motility alterations. Usually patients have a chronic history of vague symptoms, difficult to diagnose in the early stage [6,7,8,9].

The initial workup includes complete history, physical examination, complete blood count (CBC) and blood chemistry panel. The gold standard test for diagnosis of eosinophilic gastroenteritis is the biopsy diagnosis. Our study considered 3 criteria for diagnosing eosinophilic gastroenteritis as per Sternberg's Diagnostic surgical pathology guidelines. 1. Number of eosinophils more than 30/HPF 2. Eosinophilic crypt abscess 3. Eosinophilic cryptitis. But out of 85 cases of eosinophilic gastroenteritis, No single case shows the presence of eosinophilic crypt

abscess or cryptitis. All the cases show increase in number of eosinophils more than 30/HPF. Hence it is to be assumed from our study that under the criteria, eosinophilic crypt abscess and cryptitis need not to be considered as the must criteria for the diagnosis of eosinophilic gastroenteritis [10-12]. The intensity of eosinophils in GI tract is variable from one area to other. Hence, it is recommended to take 5-6 biopsies from different areas for diagnosis.

In our study, the most common site involved by eosinophilic gastroenteritis is colon. This finding is correlating with the study conducted by Abdulrahman A [14], but not correlating with the case presented by author, Wong GW [15]. As per our study, eosinophilic gastroenteritis is more common in 5th decade and more common among male patients.

The hemogram may show raised absolute eosinophil count in the peripheral blood. In our study, as per Kappa (weighted) statistics, there is 36% of agreement between the biopsy findings and blood eosinophil rise in our study. It means 36% cases show statistical significant rise in the absolute eosinophil count. Few studies conducted by Jawairia [5], Shaikh TP [16] shows < 50% of cases showing raised absolute eosinophil count. However, The studies conducted by Triantafillidis JK [4], Wong GW [15], Mori A [8], Caldwell JM [12], shows upto 70% of cases showing raised eosinophil count. We doubt these values as really significant as the case number involved in these studied are no more than 25 cases. Any study having less number cases, will show significant high erroneous values. Hence, to conclude, no study shows 100% correlation between absolute eosinophil count and eosinophilic gastroenteritis. The biopsy diagnosis remains the sole and gold standard method of diagnosis of eosinophilic gastroenteritis.

There is no well-established treatment for eosinophilic gastroenteritis. Prednisolone remains the cornerstone of therapeutic option. The beneficial effects of steroids are mediated by inhibition of eosinophil growth factors, IL3 and IL5. Other alternative treatment includes mast cell stabilizer (oral cromolyn), leukotriene antagonist (montelukast), budesonide and histamine-1 blocker (ketotifen). Immunotherapy particularly anti-IL-5 monoclonal antibodies (mepolizumab) and Anti-IgE (omalizumab) has also been adopted in clinical trial but with limited therapeutic effects [14-16].

Conclusion

Eosinophilic gastroenteritis is a rare inflammatory disorders of 5th decade, more common in male patients.

The most common site of involvement is colon. 36% of cases show significant rise in peripheral blood eosinophil count. However, biopsy diagnosis remains gold standard test for diagnosing eosinophilic gastroenteritis.

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