

Literature Review - Eosinophilic Gastrointestinal Disorders

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1. Abstract

Eosinophilic Gastrointestinal Disorders (EGID) are rare dysfunctions with diffuse presence of eosinophilic infiltrates in the gastrointestinal tract. EGID can be primary or secondary and according to the affected segment are divided into esophagitis, gastroenteritis and Eosinophilic Colitis (EC). EC correspond to the less frequent EGID. Clinical manifestations diversify according to age and affected layer of the colon, with diarrhea, abdominal pain and weight loss being common symptoms. Men and women are affected equally. The diagnosis is based on colonoscopy with biopsy of fragments, and the treatment include pharmacological and non-pharmacological management.

2. Introduction

Eosinophils are cells responsible for biological adjustment and control as well as immune responses to diseases, with its formation in the bone marrow and destination being the intestine where the dissemination through the circulation happens. The main function of the eosinophils is mucosal protection in addition to communication to other cells to protect the luminal microbiota, therefore possibly playing a role in the development of inflammatory diseases [11].

Eosinophilic gastrointestinal disorders (EGID) are rare dysfunctions with presence of eosinophilic infiltrates in the gastrointestinal (GI) tract. Eosinophilic colitis (EC) was first described in 1936. In 1959, such a disease was mentioned in the English literature in a 17-year-old boy who presented histological characteristics of eosinophilic infiltrate in the cecum and the ascending colon with symptoms such as abdominal discomfort, loss of appetite and constipation. In the 20th century, segments of the GI tract of patients were analysed and correlated with excess eosinophils and their respective clinical manifestations. Patients who developed eosinophils in the mucosa manifested anemia, hypoproteinemia and diarrhea, while eosinophilia concentrated in the muscularis propria was mainly related to intestinal obstruction. Therefore, absorptive dysfunction and diarrhea are predominant to mucosal changes and the rarest form which is related to the serosa manifest as ascites [1, 6, 8-10].

EGID can be primary, where the eosinophilic infiltrate reaches the tissue walls without any specific or secondary cause, where the eosinophilia occurs complementarily to an infestation of helminths, atopy, medications or hypereosinophilic syndrome. Dysfunction can extensively encompass the GI tract, reaching from the esophagus to the rectum, therefore are subclassified into eosinophilic

esophagitis, eosinophilic gastroenteritis and Eosinophilic Colitis (EC) respectively matching the affected region [3, 9, 10].

Finally, EC affects both children and adults, having characteristic symptoms in each age group. In addition, can attack both men and women equally. Diarrhea, abdominal pain and weight loss are the most common symptoms. The diagnosis requires the presence of an eosinophilic infiltrate in the colon, therefore, a biopsy is necessary. Furthermore, colonoscopy may show mucosal edema with change in the vascular pattern. The treatment can include both a change in diet and use of medications such as glucocorticoids leukotriene receptor antagonists and histamine antagonists [1, 2, 8].

3. Discussion and Conclusion

The term “eosinophilic colitis” was used primary to describe the eosinophilic infiltration in the colon related to abdominal pain, being associated with parasitic infections and milk intolerance in neonates. From the first diagnosis of EC, sporadic cases in both children and adults were reported in the literature. However, in the last 20 years there has been an increase in these reports, although the total number still remains low thanks to limited information related to its frequency [10].

A five years study found that the prevalence of EC in the United States is 2,1 per 100.000, being more common in adults than children. The dysfunction features a bimodal pattern, where while it occurs in infants and preschoolers it also appears in adults (30-50 years old). The etiology of EC is unspecific, but genetic and allergic factors were associated, 16% having family history, 80% reporting history of atopy and 62% food allergies. That said, the main allergies related to EC are allergic rhinitis (30%), asthma (15%) and atopic dermatitis (6,2%) [2, 5].

Histologically eosinophilic diseases in the colonic tissue of children show accumulation of mast cells and loss of granular pattern suggesting a predominant role of IgE. However, EC in adults isn't so closely related to disorders of this antibody, since it can act via mechanism by Th2 CD4-positive lymphocytes. Therefore, is common finding in GI tract the occurrence of eosinophilic with focus on unspecific immunity against parasites, antigen presentation, lymphocytes modification and sentinel lymph node. The recruitment to the tissue happens with IL-5 assistance, a cytokine formed by Th2 cells, responsible for the growth, activation and differentiation. As a result, eosinophils have cytokines and chemokines (CCL11) that, when delivered to the tissue, cause damage, chronic inflammation and fibrosis [4, 8].

EC is a heterogeneous unit and the clinical manifestations depends on the intestinal layer affected. When the mucosa is affected, malabsorption, diarrhea and protein-losing enteropathy happens. In the transmural wall, develops with thickening of the colonic wall, intestinal obstruction, volvulus, intussusception and perforation. However, in the serosa it can evolve with ascites [3, 8].

Several reasons can lead to eosinophilic infiltration in the colon,

with EC being a diagnosis of exclusion. Consequently, is important to remember the most relevant secondary causes, as helminth infection and drugs like carbamazepine, rifampicin, clozapine and naproxen. So, any other potential eosinophilic response must be ruled out before the primary diagnosis, since the dysfunction have been described in association to parasites (*Enterobius vermicularis*, *Ascaris lumbricoides*, *Trichuris trichiura*). Usually, these helminths are not present in histological samples, therefore is require of the doctor in charge is aware of possible endoscopic findings or travel history. Having any suspicion, a stool test or specific serology must be requested [4, 6, 8].

EC in general is a dysfunction of difficult diagnosis since around 50% of patients have normal colonoscopy findings. Biopsy is the main method used and can reveal layers of eosinophils breaking into the lamina propria, often extending through the muscularis mucosae to the submucosa and muscularis externa. Histological findings that can also be observed in patients with EC include eosinophilic micro abscess, eosinophilic cryptitis, and eosinophils within the surface epithelial compartment. Also, other diagnostic criteria are the presence of gastrointestinal symptoms according to affected area, histological findings (with more than 20 eosinophils per field????), exclusion of secondary causes (medications, parasites and neoplasia) and the absence of eosinophilia into another organ. However, as peripheral eosinophilia isn't present em at least 20% of the patients, usually isn't considered an important criterion [4, 5, 8].

The treatment focused on the combined diet is limited in cases of EC with food allergy. Therefore, in the childhood the EC has a benign course and the symptoms disappear when allergens such as soy or milk are interrupted. Elemental diets or food elimination provides symptomatic relief and over time can be reintroduced as soon as the food tolerance is reached. In adults, the therapeutic approach of EC begins with corticosteroid therapy that has been shown to be effective in symptoms control. The results are even more effective in form of serosa and muscular affection, where it can be reverted to obstructive condition in diagnosed patients ruling out the need for surgical treatment. Budesonide play an important role specially when the dysfunction affects the right colon and the ileum, in addition to the use of prednisone 1-2 mg/kg/day for 8 weeks with further reductions of the dosage has shown to be 80% to 100% effective in pediatric and adults patients. Prior to initiate therapy, it's important to emphasize the complete elimination of parasitic EC or drug induced, as the use o steroids in these conditions may aggravate the clinical condition [3-6].

In addition, some approaches should be taken into consideration even if they are ongoing clinical studies still. Furthermore, the imunomodulators can be used to regulate or inhibit eosinophilic growth factors, reducing infiltration and inducing the improvement of the symptoms. Montelukast (Singulair), is a leukotriene receptor antagonist, block the action from leukotriene D4 at cysteine

leukotrienes receptors and consequently reduces the recruitment of eosinophils to the GI tract. Besides, biological agents as monoclonal antibodies are also being studied. For example, omalizumab (anti-IgE) inhibits the connection of IgE and its receptor and, additionally, is capable of preventing a possible anaphylactic reaction [8].

The prognosis of EC in childhood is benign and tends to resolve spontaneously, and these children may develop dietary tolerance in a few years. In adults, EC tends to have chronic manifestations with periods of remission and active disease [8].

4. Conclusion

Eosinophilic colitis is the rarest form of EGID and can affect both children and adults. Clinically, it is associated with a compromised intestinal layer and is a limited condition in childhood, while in adults it may be chronic. Furthermore, biopsies are the main diagnosis method and the prevalence of EC is low with few studies available, highlighting the necessity for researches on the subject in order to improve the potential diagnosis and treatment to affected patients.

References

1. Shifflet A, Forouhar F, Wu GY. Eosinophilic Digestive Diseases: Eosinophilic Esophagitis, Gastroenteritis, and Colitis, *Journal of the Formosan Medical Association*, 2009; 108: 834-843.
2. Rossi CM, Lenti MV, Merli S, Licari A, Votto M, Marseglia GL, Di Sabatino A. Primary eosinophilic gastrointestinal disorders and allergy: Clinical and therapeutic implications. *Clin Transl Allergy*. 2022; 12(5): e12146.
3. Okpara N, Aswad B, Baffy G. Eosinophilic colitis. *World J Gastroenterol*. 2009; 15(24): 2975-9.
4. Esquijarosa Roque BM, Guillén Cánovas AM, Rodríguez Ramirez EA, Echevarría Martínez LE, Rico Esquijarosa LO. Colitis eosinofílica. *Rev Ciencias Médicas*. 2019.
5. Ortiz, Robin Germán Prieto, and Jhon Edison Prieto Ortiz. Eosinophilic Colitis: A Seldom Suspected Diagnosis. *Revista Colombiana De Gastroenterología*. 2020; 35(1).
6. Bates AW. Diagnosing eosinophilic colitis: histopathological pattern or nosological entity? *Scientifica (Cairo)*. 2012; 2012: 682576.
7. Abdulrahman AA, Martin AS, Eldon AS. Eosinophilic colitis: an update on pathophysiology and treatment. *British Medical Bulletin*. 2011; 100: 59-72.
8. Alfadda AA, Storr MA, Shaffer EA. Eosinophilic colitis: epidemiology, clinical features, and current management. *Therapeutic Advances in Gastroenterology*. 2010; 4(5): 301-9.
9. Collins MH, Capocelli K, Yang GY. Eosinophilic Gastrointestinal Disorders Pathology. *Frontiers in Medicine*. 2018; 4.
10. Alfadda AA, Shaffer EA, Urbanski SJ, Storr MA. Eosinophilic colitis is a sporadic self-limited disease of middle-aged people: a population-based study. *Colorectal Disease*. 2013; 16(2): 123-9.
11. Loktionov A. Eosinophils in the gastrointestinal tract and their role in the pathogenesis of major colorectal disorders. *World Journal of Gastroenterology*. 2019; 25(27): 3503-26.