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Current views

Eosinophilic gastroenteritis: Current aspects on etiology, pathogenesis, diagnosis and treatment

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SUMMARY

Idiopathic eosinophilic gastroenteritis is a rare inflammatory disease of unknown origin, characterized by diffuse eosinophilic infiltration of the gastrointestinal tract, accompanied by varying abdominal symptoms related to the location, severity and depth of invasion. Any part of the gastrointestinal tract including the esophagus may be involved, although the stomach and small bowel are the most frequently affected areas. Other sites of involvement include the pancreas, liver and biliary tree and tissues outside gastrointestinal tract. Although the exact etiology is unknown, an allergic disorder is present in almost ½ of the patients. Increased production of Interleukin-5 and activated eosinophils has been shown to be the rule in all cases. A large proportion of patients demonstrates peripheral eosinophilia. Eosinophil localization to the lamina propria at baseline is critically regulated by eotaxin, a chemokine expressed throughout the gastrointestinal tract. Diagnosis may sometimes be difficult but it can be achieved with the help of endoscopy plus mucosal biopsies, while peripheral and tissue eosinophilia supported by the findings of radiology, ultrasound and computed tomography can establish the diagnosis in the majority of cases. Eosinophilic gastrenteritis should be considered in the differential diagnosis of patients with unexplained gastrointestinal symptoms even in the absence of peripheral eosinophilia. Treatment with corticosteroids and the newer ones such as budezonide produces rapid relief of symptoms and clinical signs of the disease. Other valuable therapeutic modalities include administration of immunosuppressives, chromoglycate and dietary restrictions. Surgery is advocated only for obstructing forms of the disease. The course of the disease is characterized by frequent exacerbations and remissions. The long-term prognosis is relatively benign. Patients suffering from eosinophilic gastroenteritis require regular surveillance and prompt treatment in order to avoid possible complications.

Key words: Eosinophils, Gastroenteritis, Eosinophilic gastroenteritis, Corticosteroids, Immunosupressives, Surgery, Hypereosinophilic syndrome

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1. DEFINITION

Eosinophilic gastroenteritis is a rare, poorly understood entity with involvement of the eosinophilic leukocyte as the common denominator. The histologic hallmark is infiltration of the mucosa of the gastrointestinal tract by eosinophils.[1] Eosinophilic gastroenteritis can occur in a variety of ways. It can affect any part of gastrointestinal tract but most commonly it involves the stomach and proximal small bowel resulting in inflammation and ulceration leading to diarrhea, abdominal pain, cramping, malabsorption, and gastrointestinal loss of blood and protein. Very localized lesions are regarded as a type of inflammatory polyp, but a spectrum extends through less localized lesions to diffuse disease.

2. EPIDEMIOLOGY

Little is known about the prevalence of this disorder. Although it is sporadic in distribution, familial occurrence has been reported.[2] It can affect both sexes although it seems to be more common in men. Although the total number of patients described so far is less than four hun-

dred, the disease is probably more common than reports in the literature indicate.[3] The peak age at presentation is in the third decade. The disease could affect infancy, childhood and adolescence. Children can be affected in a proportion ranging between 15 and 20%. So far, reports concerning eosinophilic gastroenteritis from Greece, are scattered.[4]

3. AETIOLOGY-PATHOGENESIS

The cause of eosinophilic gastroenteritis is unknown. Several factors have been shown to be involved in the pathogenesis of the disease.

3.1 Allergy- Food hypersensitivity

The association between allergy and the eosinophilic infiltration of the gastrointestinal tract has been a well-received hypothesis for a long time. This association is supported by the frequent coexistence of other atopic disorders such as asthma, seasonal allergic rhinitis, eczema, and drug allergies. However, there is considerable controversy regarding the relation of eosinophilic gastroenteritis to food hypersensitivity. Indeed, in some patients with the mucosal form, the disease reflects allergy to some components of the diet, e.g. milk protein. These patients usually have a family history of atopy and elevated serum IgE levels. Diary products are most often implicated in the causation of eosinophilic gastroenteritis. RAST for IgG anti-milk antibodies and IgE tests for whole milk, lactalbumin and beta-lactoglobulin usually give positive results. Other foods that appear to be causally related include eggs, pork, beef, and gluten-flour products. The percentage of patients reporting food allergy is close to 50%.[1]

3.2 Infestations

Several reports from almost every country suggest that local out-breaks of the disease are related to infestation with certain nematodes, schistosomiasis, Ancylostoma caninum[5,6], Toxocara canis,[7] Ascaris suum,[8] other parasites such as anisakis,[9] and a dog hookworm. Eosinophilic enteritis without gastric involvement is quite common in northeastern Australia. In this area at least 40% of patients have evidence of infestation by the common dog hookworm, Ancylostoma caninum. Infestation can be immunologically diagnosed by detecting antibodies to an immunodominant secreted hookworm protein: Ac68. The characterization of this protein was achieved recently by purification of the native protein from Ancylostoma caninum extretory/secretory products using size exclusion followed by anion exchange chromatography.[6]

3.3 Other disorders

In some patients eosinophilic gastroenteritis seems to be a part of vasculitis or other multisystem diseases e.g. allergy to drugs such as gold and gemfibrosil,[10] hypereosinophilic and Churg-Strauss syndromes, or polyarteritis nodosa. In some cases, eosinophilic gastroenteritis could be considered as a paraneoplastic manifestation.[11,12]

3.4 The role of eosinophils

Apart from eosinophilic gastroenteritis, eosinophils have been implicated in the pathogenesis of many disorders including allergic reactions, asthma, atopic dermatitis, allergic rhinitis, and certain eye disorders. Eosinophils are derived from the bone marrow and, although found in the peripheral circulation, are primarily tissue-dwelling cells. The eosinophil is distinguished by its characteristic granules, which stain with acid dyes such as eosin. The main constituents of eosinophils are major basic protein (MBP), eosinophil-derived neurotoxin, eosinophilic cationic protein and eosinophilic peroxidase. Eosinophils also produce other mediators such as platelet-activating factor, leucotrienes, the neuropeptide substance P and Transforming Growth Factor,[13-15] cytokines that are chemotactic for the eosinophils. The release of the eosinophil granules is quite important in parasite killing, as eosinophil degranulation results in release of many cytotoxic granule proteins.[16] The effector functions of eosinophils appear to be derived primarily from release of lipid mediators and proteins including cytokines and granule proteins.

Resident eosinophils are a key element of the gastrointestinal immune system. Under normal conditions most eosinophils reside in the lamina propria of the stomach and intestine. The number of eosinophils present in the gastrointestinal tract, are substantially higher than in other tissues.

Recruitment of eosinophils in the tissue is a predominant feature in eosinophilic gastroenteritis. Defining the mechanisms that control the recruitment of eosinophils is fundamental to understanding the disease process. A variety of substances have been shown to have chemotactic activity for eosinophils including platelet-activating factor, histamine, leucotriene B4, and eosinophilic chemotactic factor of anaphylaxis from mast cells. Eosinophil localization to the lamina propria is regulated by eotaxin, a chemokine expressed throughout the gastrointestinal tract.[17] Recent experimental work establishes a critical pathological function for eotaxin in gastrointestinal allergic hypersensitivity.[18] It is of interest that eo-

taxin is significantly increased in the serum of patients with active Crohn's disease and ulcerative colitis, suggesting that this cytokine also plays a role in the pathogenesis of inflammatory bowel disease.[19] Eotaxin is an efficient promoter of eosinophil transmigration in vitro, and its effect depends predominantly on the activation of the plasminogen/plasmin system.[20] Recent works also suggest that gastrointestinal eosinophils express the alpha4beta7 integrin, which is responsible, in part, for eosinophilic homing.[21]

The most important characteristic of eosinophilic gastroenteritis is the infiltration of the bowel wall by activated eosinophils.[22] It seems that eosinophils once activated posse the capacity to synthesize cytokines and regulate their own proliferation and differentiation.

3.5 The role of cytokines

Interleukin-5 (IL-5), a cytokine, known to be produced by T lymphocytes and eosinophils, is considered to be a key regulator of eosinophilic gastroenteritis. A high plasma level was noted on patients with active eosinophilic gastroenteritis.[23] However, during remission IL-5 was undetectable. Activated mast cells are also a potent source of IL-5 in human intestinal mucosa.[24]

Apart from IL-5, other cytokines such as IL-4 and gamma-interferon regulate IgE synthesis and eosinophilopoiesis in vitro. Most IL-4 and IL-5 production is by CD4+ T cells. On the contrary, γ-interferon synthesis by CD4+ T cells is normal.[25] These lymphokine abnormalities are consistent with increased levels of IgE and eosinophilia seen in allergic eosinophilic gastroenteritits.

3.6 Tissue damage

Once in the tissues, some eosinophilic mediators are released on patients with eosinophilic gastroenteritis. Mechanisms that could be involved in the tissue damage include immune-complex mediated hypersensitivity, delayed-type hypersensitivity and immediate-type hypersensitivity to food antigens with a subsequent late-phase type reaction.[26] Eosinophilic degranulation seems to be the key element responsible for tissue damage. Secretory IgA has been demonstrated to be one of the most powerful stimulants for eosinophilic degranulation.

It seems that activation of eosinophils and the release of their mediators may initiate local tissue damage. Major Basic Protein has been shown to have direct toxic effects on various mammalian cells. In addition Major Basic Protein can cause mast-cell degranulation, which may then augment the inflammatory response by releasing of several proinflammatory cytokines. Moreover, mast cell activation may in fact act to dampen the inflammation by the release of heparin from connective tissue-type mast cells, which has been shown to neutralize some of the actions of Major Basic Protein. Finally, mast cell activation may be doing both.

A synopsis of eosinophilic biology and the tissue damage produced by them on patients with eosinophilic gastroenteritis is shown in figure 1.

4. CLINICAL FEATURES

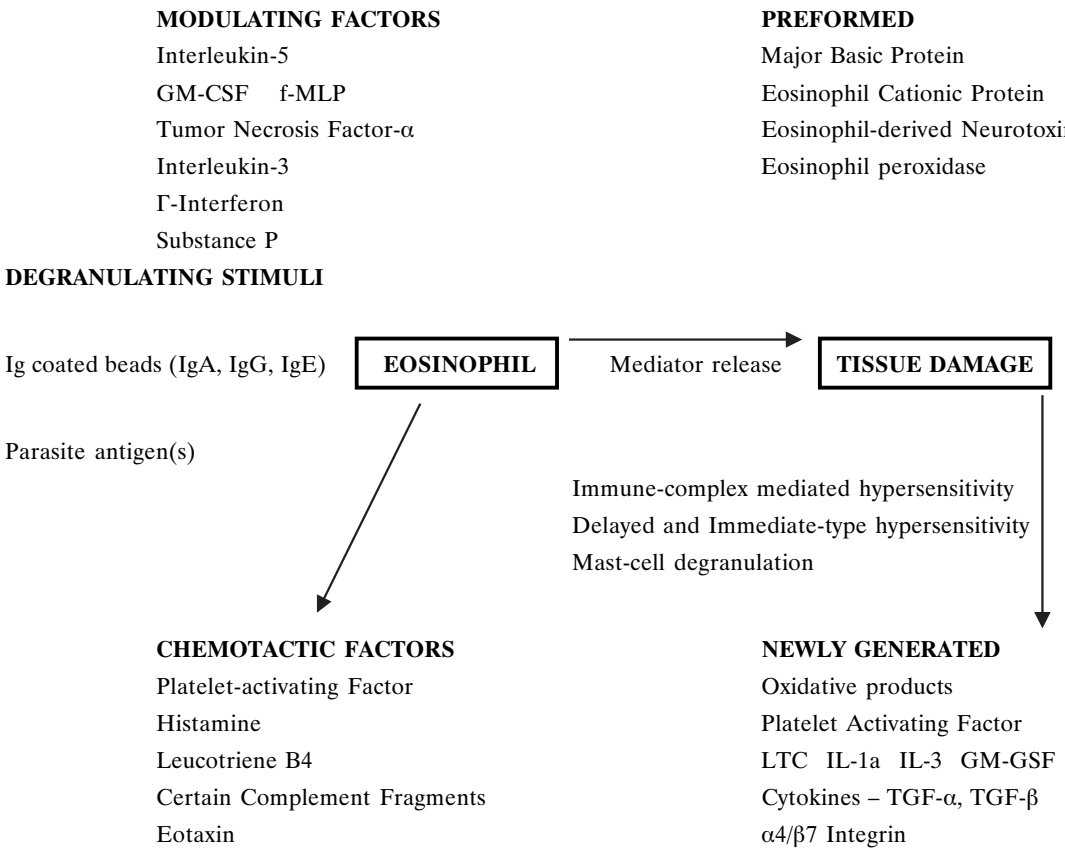
Because the whole gastrointestinal mucosa may be involved, signs and symptoms of eosinophilic gastroenteritis depend on the depth of bowel wall involvement and the presence of esophagitis, gastritis, enteritis or colitis. Symptoms therefore include nausea, vomiting, abdominal pain, weight loss, protein-loosing enteropathy, steatorrhea, generalized malabsorption, pallor, maelena or hematochesia. Accompanying symptoms include allergic phenomena, especially eczema, rhinitis, asthma, hepatomegaly, splenomegaly and involvement of prostate, gallbladder, or urinary bladder. However, the most common symptoms described in large series of patients with eosinophilic gastroenteritis are abdominal pain, diarrhea, vomiting and nausea.[27]

According to Kleins proposal,[28] the disease can be classified into three types: a) predominant mucosa involvement, b) predominant muscle layer involvement and c) predominant subserosal involvement. Although this classification may be useful conceptually and in terms of defining primary tissue involvement, in fact tissue eosinophilia in eosinophilic gastroenteritis frequently involves multiple layers of the bowel.

a) Diffuse submucosal involvement produces malabsorption with anemia and protein-loosing enteropathy. Symptoms include intermittent nausea, diarrhea, weight loss and abdominal pain. A history of atopy is present in more than 50% of patients.

b) Involvement of muscle layers tends to produce obstruction. Patients with this type of gastrointestinal involvement manifest signs and symptoms of intermittent pyloric outlet or incomplete small intestinal obstruction owing to thickening and rigidity of the wall of the stomach and small intestine. Involvement may be localized or diffuse.

c) Serosal involvement can produce painful peritonitis and ascites consisting of transudate rich in eosinophils (12-95%). This form is relatively uncommon (less than 10% of the reported cases) and it may appear alone



IL= Interleukin, TGF-a= Transforming Growth Factor-alpha, CSF= Colony Stimulating Factor, IgG= Immunoglobulin G.

Figure 1. Synopsis of eosinophilic biology and tissue damage on patients with eosinophilic gastroenteritis.

or in combination with either of the other clinicopathological patterns.

Apart from the previously mentioned symptoms the clinical presentation of eosinophilic gastroenteritis could be quite wide. Eosinophilic gastroenteritis can present with colonic perforation due to eosinophilic colitis accompanied by necrotizing granulomas.[29] It could also present with the form of total involvement of the gastrointestinal tract,[30] as acute appendicitis,[31] with biliary and partial duodenal obstruction,[32] as a protein-loosing enteropathy,[33] with simultaneous involvement of biliary and gastrointestinal tract,[34] with ascites and splenomegaly,[35] as a giant gastric ulcer,[36] with ileus and ascites,[37] with dyspepsia,[38] with proximal jejunal obstruction,[39] with eosinophilic pneumonia,[40] and finally as a solitary duodenal ulcer.[41]

Other distinct types of presentation of eosinophilic gastroenteritis include eosinophilic esophagitis and eosinophilic pancreatitis. Eosinophilic esophagitis can be defined in a fashion similar to eosinophilic enteritis as eosinophilic infiltration of the esophageal wall of unknown origin often associated with an allergic disorder and/or peripheral eosinophilia.[42] It seems that esophageal involvement may be a more common than previously reported and can occur as isolated involvement without other features of eosinophilic gastroenteritis.[3]

Isolated eosinophilic infiltration of the pancreas is uncommon. It can be associated with eosinophilic gastroenteritis, or the potentially fatal hypereosinophilic syndrome.[43] Acute pancreatitis may be induced by pancreatic duct obstruction caused by marked swelling of the papillary region of the duodenum due to eosinophilic infiltration.[44]

A special form of eosinophilic gastroenteritis is the so-called allergic eosinophilic gastroenteritis. This disorder is characterized by elevated serum levels of IgE, presence of specific IgE to some food antigens and by eosinophilia of tissue and blood.

5. DIAGNOSIS

The diagnosis of eosinophilic gastroenteritis should be considered if the relevant clinical signs are present in conjunction with an elevated peripheral eosinophil count. However it must be emphasized that peripheral eosinophilia may not be present in all cases and elevated serum IgE has been reported in some cases. Evidence of tissue eosinophilia should be sought to support the diagnosis, although there is no accepted scale for measuring tissue eosinophilia. It must be emphasized that tissue eosinophilia is a component of various other disorders.

A careful search for food sensitivity and gut parasites should be undertaken in all patients using exclusion diet and multiple fecal examinations. It should be kept in mind that parasites may only be detectable in tissue removed surgically on patients with obstruction.

A detailed history of drug use must be carefully obtained in all cases of eosinophilic gastroenteritis in order to exclude a possible secondary cause of this syndrome. It is well established that a large number of pharmaceutical agents can cause peripheral hypereosinophilia including the angiotensin-converting enzyme inhibitor Enalapril[45] and gemfibrozil.[46] Moreover, because occult parasitism could be an elusive and unrecognized cause of some cases of eosinophilic gastroenteritis, a search of duodenal fluid obtained either by endoscopy or nasogastric tube for parasites such as Lamblia Giardia and strongyliasis must always been performed.[47]

5.1 Hematological findings

Eosinophilia is only present in the peripheral blood of a minority, but provides the essential clue for diagnosis. In a relevant study[1] among 40 patients with eosinophilic gastroenteritis, 23% had normal peripheral eosinophilic count. Additionally, Johnstone and Morson[48] reported that 24 out of 99 patients with eosinophilic gastroenteritis had normal eosinophilic count in the peripheral blood. Erythrocyte sedimentation rate is abnormal in ΄Ο of patients.

5.2 Endoscopy

Endoscopically the gastrointestinal mucosa may vary in appearance from normal to ulcerated, hemorrhagic or nodular. Endoscopically obtained gastric biopsies are necessary to identify coexisting eosinophilic gastroenteritis in allergic patients with blood eosinophilia and concurrent gastrointestinal symptoms.[49] In cases of eosinophilic esophagitis pseudomembranes, marked mucosal friability, as well as narrowing of the esophageal lumen can be seen. In the stomach, when the mucosa is involved directly, nodularity and ulceration may be present and may suggest either Crohn's disease or gastric malignancy. Sometimes the endoscopic picture can mimic a benign polyp.

In some cases valuable information can be obtained by using endoscopic ultrasonography because this procedure enables the examiner to ascertain the muscular involvement in obscure cases.[50]

5.3 Diagnostic laparascopy

The case of eosinophilic gastroenteritis described by Vara-Thorbeck[51] illustrates the effectiveness of laparascopy as a diagnostic tool to diagnose the cause of ill-defined abdominal discomfort with inconclusive laboratory findings that formerly would have needed more surgically aggressive laparatomy to resolve.

5.4 Radiology

Radiological examination of the stomach and small intestine shows patchy or diffuse abnormalities of a non-specific nature, which mimic other conditions, e.g. malignant or benign tumors and Crohn's disease. Barium studies usually reveal mucosal edema and/or thickening of the small intestinal wall, partial gastric outlet obstruction, narrowing of lumen of the terminal ileum. It must be stressed, however, that radiological appearance depends on the depth of bowel wall involvement. Radiographic findings seen on cases with eosinophilic gastroenteritis are due to predominantly mucosal and submucosal disease and include antral and small-bowel thickening, ulcerations, polyps and luminal narrowing. When subserosal disease is present, eosinophilic ascites, eosinophilic pleural effusions, lymphadenopathy and omental and mesenteric thickening may also be seen.

In a large study of 20 patients with eosinophilic gastroenteritis, thickening of mucosal folds in the stomach (seven cases), small intestine (four cases) or both (two cases) were the most common findings. Nodular fold enlargement was present in the stomach in three and in the small intestine in four, cases.[52]

In the study of Vitellas et al[3] the most common radiographic manifestations of the stomach and small bowel were stenosis and fold thickening, respectively. It is of interest that thirteen patients had esophageal involvement, with esophageal stricture being the most common radiographic abnormality.

5.5 Abdominal Ultrasonography and Computed Tomography

Ultrasound and computed tomography examination

usually shows thickening of the intestinal wall.[53] Sonography is a quick, low-cost and non-invasive means of diagnosing eosinophilic gastroenteritis and together with other clinical, laboratory and endoscopic data may prevent unnecessary and potentially dangerous abdominal surgery.[54] Under ultrasound guidance we can also obtain percutaneous biopsy to facilitate the correct diagnosis.[55] The benefits of CT, using water as an orally administered contrast agent, were stressed in a relevant paper.[56] Computed tomography enabled the authors to suggest a full thickness biopsy, after mucosal biopsies had remained repeatedly negative.

5.6 Other imaging techniques

Tc-99m HMPAO labeled WBC SPECT has been used recently in the study of patients with eosinophilic gastroenteritis before and after successful medical treatment.[57] The sites of involvement were identified in all patients before treatment. All abnormal images became normal after successful medical treatment.

5.7 Pathologic findings

The eosinophilic infiltration tends to affect specific layers of the gastric or intestinal wall. Lesions are usually multiple and patchy. When the main site of involvement is restricted to the mucosa it tends to produce edema, lymphatic dilatation as well as an intense sheet-like eosinophilic infiltrate (Figure 1). It is not uncommon to find eosinophils within the epithelium of gastric pits (Figure 2), crypts and villi (Figure 3) or extending into the submucosa with associated edema (Figure 4). Eosinophilic infiltration may cause epithelial cell necrosis, pit or crypt abscesses, erosions, shallow ulcers, or villous atrophy. When the lesions occupy submucosa, edema is more common and destruction of the wall and fibrosis may be seen. When muscularis propria is involved, it usually becomes hypertrophic. In that case, muscle fibers are separated by dense eosinophilic infiltrates and edema. The mucosa may exhibit only a small number of eosinophils, although sometimes a heavy infiltration of submucosa could be the prominent feature. Finally, diffuse edema and dense eosinophilic infiltration are the main characteristics of serosa involvement.

Even today, there are no standards for making the histologic diagnosis. It is worth noting that endoscopically obtained biopsies can miss the correct diagnosis of eosinophilic gastroenteritis in up to 1/8 of patients.[1] This is due to either sampling error inherent in diagnosis of such a patchy process or mucosal sparing. On the other hand, other diseases are characterized by prominent mucosal eosinophilia. Ulcerative colitis, particularly in

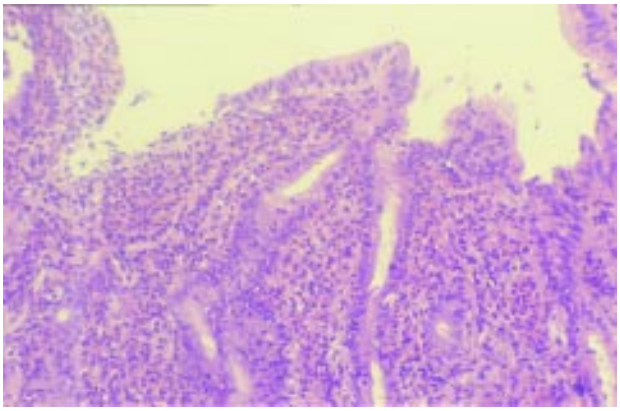


Figure 2. Eosinophilic infiltration of the gastric pits and surface epithelium with erosions (H-EX200).

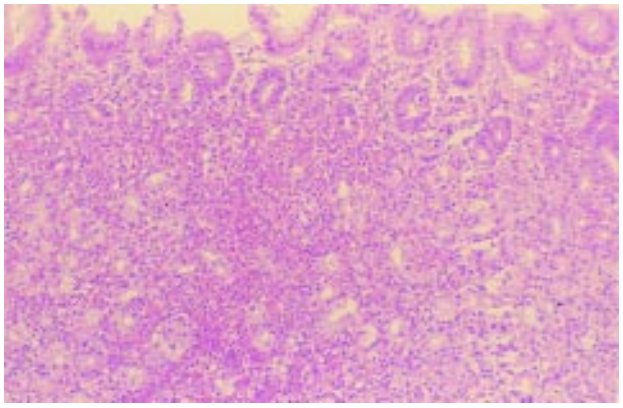


Figure 1. Sheetlike eosinophilic infiltration and edema of the fundic gastric mucosa (H-E X 100).

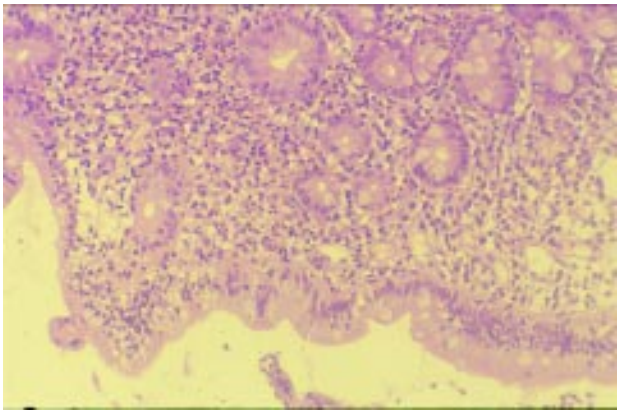


Figure 3. Dense eosinophilic infiltration of the duodenum with villous atrophy (H–E X200).

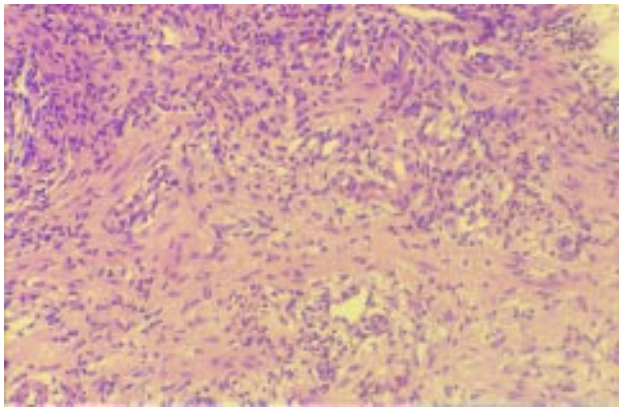


Figure 4. Infiltration of the muscularis mucosa by eosinophils and extention into the submucosa (H-EX200).

the phase of resolution, Crohn's disease, T or B-cell lymphomas, collagen disease, especially scleroderma and dermatomyositis, bowel parasitoses and the rare Churg-Strauss syndrome must be excluded.

The basic characteristics and differentiation of these disorders from eosinophilic gastroenteritis are shown in Table 1.

Table 1. Histological differential diagnosis of eosinophilic gastroenteritis

Disorder	Characteristic
Inflammatory polyp	Polypoid appearance, lamina propria infiltrated by fibroblasts, dense vascularity, no peripheral eosinophilia.
Infestations	Presence of eosinophilic granulomas.
Collagen disease	Eosinophilic infiltration of the superficial lamina propria.
Churg-Strauss syndrome	Presence of vasculitis
Inflammatory bowel disease	Isolated or small aggregates of eosinophils. Very rarely can penetration of submucosa muscularis be seen.
Lymphomas	Despite dense eosinophilic infiltration correct diagnosis cannot be missed because of the presence of lymphocytes with atypical features.

6. DIFFERENTIAL DIAGNOSIS

As was stressed previously, differential diagnosis of eosinophilic gastroenteritis includes a variety of disorders such as polyarteritis nodosa, Crohn's disease, intestinal lymphoma, idiopathic hypereosinophilic syndrome, gastric cancer, eosinophilic granuloma, and parasitic infestation. All of these diseases may be associated with diarrhea, peripheral eosinophilia (except of eosinophilic granuloma), and eosinophilis within the gut wall. The clinical setting and findings at mucosal biopsy or surgery are usually sufficient to differentiate these various disorders. If there is evidence of multisystemic disease (especially polyarteritis nodosa), these diseases should be excluded by muscle biopsy or visceral arteriography. Eosinophilic esophagitis should be considered in the differential diagnosis of dysphagia.

7. TREATMENT

7.1 Dietary restrictions

If there are not known or suspected food sensitivities, milk withdrawal results in remission of the disease while re-challenge is associated with both symptomatic and histologic recurrence. Because only a small number of patients enter remission with diet therapy alone, it is likely that these patients represent a unique subpopulation of those with eosinophilic gastroenteritis. Sequential elimination of these dietary constituents is recommended until symptom resolve, as this kind of treatment is the simplest potentially effective one.

7.2. Corticosteroids

If symptoms do not resolve or actually worsen during dietary restrictions and in the absence of a specific cause or the need for surgical treatment, severe symptoms justify the use of corticosteroid therapy on an empirical basis. Steroids comprise the cornerstone of medical treatment in all types of eosinophilic gastroenteritis. Prednisone 20-40 mg peros daily or its equivalent usually results in dramatic improvement of all manifestations of the disease. After 7-10 days of therapy the dose can frequently be tapered slowly over several weeks. A few patients require continuous, long-term steroids to maintain remission (usually 5-10 mg/day). When long-term steroid use appears inevitable, one should try alternate-day steroids, although experience suggests that alternate day regimens are ineffective in maintain remission. Recently, montelukast, a leucotriene receptor antagonist, has successfully been used in a patient with relapsing eosinophilic gastroenteritis. Under this kind of treatment the patient was able to taper off the steroids and to maintain remission.[58] Most patients with eosinophilic ascites have multiple areas of serosal involvement and respond dramatically to steroids. Butesonide has also recently been

used in some patients. In the description of Tan et al[59] the drug was given by mouth not in the form of enteric-coated capsules but actually in the form of tables diluted in water, because of the stomach involvement. With this treatment regimen, remission can be maintained for more than two years.

7.3. Cromoglycate

A favorable response to oral cromoglycate or antihistamines has also been described with prolonged remission after discontinuing the treatment. The usual dose of the drug is 300mg 4 times daily for 4 to 5 months.[60,61] Under this treatment the clinical symptoms disappeared and at the end of treatment a reduced inflammation with an almost complete decrease of eosinophilic infiltration can be observed. According to some descriptions[62] oral cromolyn therapy should be considered for patients with eosinophilic gastroenteritis in whom food allergy has been implicated.

7.4. Immunosuppressives

In the rare case of failure to respond to steroids, there is an indication for additional immunosuppressive therapy[63] surgery or total parenteral nutrition. A satisfactory response to oral azathioprine in two women with eosinophilic gastroenteritis has been reported.[64] If the patients have diffuse mucosal disease, surgery should be avoided and one should consider adding cyclophosphamide or azathioprine to the steroid regimen.

7.5. Surgery

If disease is localized to a defined segment of bowel surgical resection is indicated and may be curative. However, even after resection of what appears to be localized disease, recurrence in another segment of the bowel is common.[65] In the absence of obstructive symptoms, surgery should not be undertaken solely to confirm the diagnosis before a trial of corticosteroid therapy.

7.6. Total Parenteral Nutrition

If the combination therapy fails and the patient has severe symptoms or he is steroid dependent, the use of home parenteral nutrition must be considered.

7.7 Future treatments

It has been suggested that strategies targeting T lymphocytes may be efficacious in treatment of this disorder.

8. PROGNOSIS

The prognosis for remission is favorable, although eosinophilic enteritis is lifelong and chronic. However, the long-term prognosis is difficult to judge. In the absence of serious multisystem disease, e.g. polyarteritis, it appears to be good if a cause can be eliminated or if the initial response to treatment is satisfactory. Acute complications include obstruction and, rarely, perforation. In a series of six patients being followed-up for 2-10 yrs, one had remission, four needed a small maintenance dose of steroid, and one suffered from relapse with intestinal perforation.[66] Mortality is generally rare and results from complications of the disease. Patients with eosinophilic gastroenteritis appear to have no increased risk of gastrointestinal malignancies. Many of the deaths reported so far may be due to polyarteritis nodosa, visceral lymphoma, or the hypereosinophilic syndrome. The prognosis of hypereosinophilic syndrome is largely unknown. However, transition to eosinophilic gastroenteritis and clonal expansion of T cells has been described after a long period of time (20 years).[67]

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