Original Article

Infiltration of Appendix with Eosinophils in Acute Appendicitis

Amrta Tiwar[1], Mohammad Frayez[2], Nidhish Kumar[3]

[1]Associate Professor, Department of Pathology, Autonomous State Medical College Shahjahanpur,
[2,3]Assistant Professor, Department of Pathology, Autonomous State Medical College Shahjahanpur

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Abstract

Background and Aim: Despite the fact that the precise origin of acute appendicitis is unknown, luminal obstruction, nutrition, and hereditary factors are likely to be involved. The intricate evolutionary history of the appendix and the broad ranges in evolutionary rates among various animals suggest that the feature is recurrent. Keeping the above points in mind, the present study aimed to study the etiology and prevalence of eosinophilic appendicitis.

Material and Methods: The present is the prospective study done in the department of pathology in the medical college associated with a hospital. A total of 250 cases were studied for one year. Tissue specimens were included from appendectomy procedure done either as an elective or emergency procedure. For light microscopy, one slide from each block was stained with H&E to arrive at a diagnosis.

Results: The most common reason for performing appendectomies was acute appendicitis in 144 instances, followed by peri-appendicitis in cases. A male predominance was also noted in cases of acute appendicitis and periappendicitis. The most frequent age range to be affected in eosinophilic appendicitis cases was 10 to 20 years. Twenty individuals were diagnosed with eosinophilic appendicitis out of the 250 cases that were received. In these cases, the muscularis propria had eosinophil infiltration, and there were a few spots where there was edema dividing the muscle fibres.

Conclusion: Rare condition known as acute eosinophilic appendicitis has hazy symptoms. In order to effectively approach and manage patients, it needs to be thoroughly investigated. The mainstay for making diagnoses continues to be histopathology.

Key Words: Acute Appendicitis, Eosinophilia, Pathology, Periappendicitis

Introduction

The diagnosis of acute appendicitis, a frequent surgical emergency, often involves a history, clinical examination, and leucocytosis. Many inflammatory and non-inflammatory conditions resemble appendicitis. Females in particular and extremes of age show this. perhaps a minor case of appendicitis has the potential to worsen and perhaps become fatal. So, instead of waiting for a certain diagnosis, doctors frequently do surgery. As a result, the incidence of negative appendicitis was rather significant

Corresponding Author: Nidhish Kumar, Assistant Professor, Department of Pathology, Autonomous State Medical College Shahjahanpur.

E-mail: nidishkumar21@gmail.com

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(15–30%). Negative exploration reportedly has a 5- to 15% morbidity rate.[1,2]

Acute appendicitis has a 7% lifetime risk in Western populations. This clinical ailment is characterized by discomfort and tenderness of the right iliac fossa, vomiting, fever, and an increased white blood cell count. In cases of acute appendicitis, the muscularis propria frequently has neutrophil infiltration. It is believed that eosinophil infiltration of the musclaris, the histopathologic aetiology of acute appendicitis, is incredibly uncommon. Acute eosinophilic appendicitis has been reported in a small number of instances, and the illness is still not fully understood.[3,4]

Despite the fact that the precise origin of acute appendicitis is unknown, luminal obstruction, nutrition, and hereditary factors are likely to be involved. The early eosinophilic infiltration in the muscle layer of acute appendicitis, however, may result in type I hypersensitivity, according to multiple studies. Therefore, type I hypersensitivity results in inflammation, which is aggravated by infection. An eosinophil-edema appendicitis lesion can occasionally occur without an underlying infection when type I hypersensitivity reaction is more severe. The name for these lesions is acute eosinophilic appendicitis.[5-7]

The intricate evolutionary history of the appendix and the broad ranges in evolutionary rates among various animals suggest that the feature is recurrent. Keeping the above points in mind, the present study aimed to study the etiology and prevalence of eosinophilic appendicitis.

Materials and Methods

The present is the prospective study done in the department of pathology in the medical college associated with a hospital. The tissue specimens were included from the appendectomy procedure done either as an elective or emergency procedure in the surgical department of the hospital. The ethical committee of the college institute was informed about the study, and the ethical clearance certificate was obtained from them before the start of the study. A total of 250 cases were studied for one year. The related clinical history and the Patients' data were obtained from the surgical department of the hospital. The tissue samples of the studied cases were processed in the department of pathology.

Inclusion Criteria:

All acute appendicectomy case specimens were examined.

Also included were suspected cases of gastroenteritis-related worm presentation.

Exclusion Criteria:

Cases of gangrenous appendicectomy were not included.

Tumours of the appendix were disqualified.

For light microscopy, all specimens were fixed in neutral buffered formalin for 12 to 24 hours. The specimens treated in 10% formalin as well as the demographic information were gathered. The specimens' gross exams were looked at. The appendix's length and the point at which its thickness was at its greatest were observed. Analysis was done on the perforation and gangrenous change areas. Three cross-sections were obtained after the object had been fixed in formalin to illustrate the base, middle, and tip.

Technique of Processing:

To make a diagnosis using light microscopy, one slide from each block was stained with H&E. These staining outcomes were evaluated: Blue to black nuclei Pink cytoplasm and other materials. The entire appendix was sectioned in cases where eosinophilic appendicitis was detected in order to exclude areas of neutrophil infiltration. Additionally, a stool analysis was performed to rule out worm infestation.

Analytical statistics: By using the Chi-square test for qualitative variables, the clinical and morphological factors were compared between the groups.

Results

The study included 250 appendectomies carried out at the affiliated hospital and Medical College. A total of 250 patients who had appendectomies were examined; 146 of these patients had emergency appendectomies, and 104 patients had elective appendectomies.

A substantial portion of the patients who underwent appendectomies were between the ages of 10 and 20 years, followed by the 20 to 30 age group. Patients ranged in age from 0 to 70 years. The male gender was more frequently afflicted than the female population in the age range of 10 to 20 years. Less appendectomies were done on patients who were younger and older. The most common reason for performing appendectomies was acute appendicitis in 144 instances, followed by peri-appendicitis in cases. A male predominance was also noted in cases of acute appendicitis and periappendicitis.

The most frequent age range to be affected in eosinophilic appendicitis cases was 10 to 20 years. Additionally, eosinophilic appendicitis revealed a masculine bias. Peritonitis was found in one case of eosinophilic appendicitis that was linked to eosinophilic enteritis.

Twenty individuals were diagnosed with eosinophilic appendicitis out of the 250 cases that were received. In these cases, the muscularis propria had eosinophil infiltration, and there were a few spots where there was edoema dividing the muscle fibres. In 18 cases of eosinophilic appendices, the mucosa was normal and free of ulcers. The muscular layer was thin in all of the analyzed cases. These cases showed varied degrees of oedema penetrating the muscle layer. Lymphoid hyperplasia was present in approximately 15 cases of eosinophilic appendicitis.

Table 1: Gender wise distribution of study participants

Gender	Number of patients
Males	170
Females	80
Total	250

Discussion

Acute eosinophilic appendicitis was proposed in 1996 for the first time by Aravindan; then it was defined in 2010 by Aravindan et al. They reported that an allergic reaction type 1 hypersensitivity is a predisposing event, which triggers the acute inflammation of the appendix.[8] This inflammation involves muscularispropria eosinophilic infiltration and edema, both are considered the hallmarks of this disease entity. Type 1 hypersensitivity is not only developed in the appendix but also in other adjacent areas such as ileum and cecum, whereas the appendix considered the most affected organ by allergic reaction. Although eosinophils are normally found in submucosal layer and lamina propria of the appendix, evidence of infiltration through the muscularispropria combined with edema should raise the suspicion of acute eosinophilic appendicitis.[9,10]

Appendectomy is the most frequently practiced emergent surgical procedure accounting for 1%-2% of all surgical operations. Acute appendicitis can occur at any age; however, most commonly occurs at younger ages particularly between 10 and 20 years. Although acute appendicitis has been recognized for more than 100 years, its etiology and pathogenesis still remain to be elucidated. However, it has been considered that its etiology is multifactorial and that luminal obstruction, diet, and family factors may play a role in its pathogenesis.[11]

The AEA was created in 2010 by Aravindan et al. after Aravindan first proposed the idea in 1997. Aravindan discovered that the mural nding's ltrate is the solitary and persistent eosinophil in acute appendicitis in a study including 120 appendicectomies. Additionally, he added that the ltrate, which is eosinophilic in type and present in acute appendicitis, may be an early indicator of Type I hypersensitivity. According to his theory, the lesion is a precursor of acute appendicitis, which includes AEA.[12]

A case of AEA that occurred on a background of allergy brought on by amoebiasis was reported by Tufan Egeli et al. A thorough histopathologic analysis of the surgical specimen indicated severe eosinophilic infiltration and edoema in the serosa and muscle layer of the appendix. Since the patient lived in a region where parasitic infestation was common, direct stool inspection was done in the immediate post-operative period. Examining the stools produced trophozoites of E. histolytica, and AEA was thought to be connected to the allergic reaction brought on by this parasite. Examining the stools in our investigation revealed no parasites.[12,13]

In cases of AEA, the appendix was enlarged and hyperemic, similar to acute suppurative appendicitis, but there was no exudate. Acute eosinophilic

appendicitis's histopathologic characteristics include edoema that separates the muscle fibres and a strong eosinophilic infiltration in the muscularis propria in the absence of neutrophils. To identify acute eosinophilic appendicitis, all of these characteristics were identified in our cases.[14]

Aravindan et al. identified the eosinophil edoema lesion as a distinguishing feature of acute eosinophilic appendicitis. Additionally, he says that this is present in all cases of acute focal appendicitis and acute suppurative appendicitis in regions where neutrophils are insufficient or nonexistent. We had observed eosinophil edoema lesions in all of our instances of acute eosinophilic appendicitis. Additionally, in a few cases of acute suppurative appendicitis, we observed an eosinophil edoema lesion.

Conclusion

Rare condition known as acute eosinophilic appendicitis has hazy symptoms. In order to effectively approach and manage patients, it needs to be thoroughly investigated. The mainstay for making diagnoses continues to be histopathology. Appendicitis has a complex aetiology that includes blockage, nutrition, and infection. A recently described aetiology of inflammation is type 1 hypersensitivity allergic reaction.

Ethical approval was taken from the institutional ethical committee and written

Informed Consent was taken from all the participants.

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