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Original Research Article

Spectrum of Histopathology of Inflammatory Bowel Disease in A Teaching Hospital, Bangalore

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Abstract

Introduction: Inflammatory bowel diseases (IBD) are represented mainly by Ulcerative colitis (UC) and Crohn's disease (CD) but they also include non-infectious inflammations of bowel. The diagnosis depends on clinical, radiographic, endoscopic and histologic features. Ulcerative colitis divided into three phases active phase, remission phase and resolving phase. *Crohn's disease* is a chronic inflammatory *disease* of the digestive tract. Symptoms include abdominal pain and diarrhoea, sometimes bloody, and weight loss.

Objective: To know the histopathological distribution of inflammatory bowel diseases in teaching hospital. To determine the extent and severity (different phases) of ulcerative colitis.

Material and Methods: The present study was conducted in the Central laboratory, Department of Pathology, Kempegowda institute of Medical Sciences, Bangalore ,during the period July 2010 to June 2013 . One hundred and twenty colonoscopic biopsies from patients attending KIMS Hospital who mainly presented with lower gastrointestinal symptoms were studied. Clinical details, colonoscopic findings were obtained. All the colonoscopic biopsy specimens were immediately fixed in 10% formalin for 24 hours, routinely processed, embedded, serial sections were prepared and stained with Hematoxylin & Eosin and studied under the light microscope.

Results: 30 cases (20%) had inflammatory bowel disease. 28 cases of ulcerative colitis and 2 cases of crohn's diseases were detected. 19 cases of ulcerative colitis were in active phase, 3 in resolving phase, 5 in remission phase and 1 case presented with dysplasia.

Conclusion: Mucosal biopsy may be used to monitor the course after therapy and to estimate activity in cases of apparent remission or possible relapse. Colonoscopy with multiple biopsies is now the routine investigation at diagnosis and follow up of patients with ulcerative colitis and Crohn's disease.

Keywords: Inflammatory Bowel Diseases (IBD); Ulcerative Colitis (UC); Crohn's Disease (CD); Colonoscopic Biopsies.

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Introduction

Inflammatory bowel diseases (IBD) are represented mainly by Ulcerative colitis (UC) and Crohn's disease (CD) but they also include non-infectious inflammations of bowel. The diagnosis depends on clinical, radiographic, endoscopic and histologic features [1-4].

Ulcerative colitis as a separate entity was first described by Wilks and Moxan (1875). Idiopathic ulcerative colitis

has been defined as an acute and chronic inflammatory and ulcerative disease of the rectum and colon of unknown aetiology [5]. Most of them present with chronic diarrhoea. Post prandial diarrhoea and nocturnal diarrhoea is common. They pass large quantity of mucus often with pus and blood.

Failure to absorb salt and water is predominant factor, due to reduced Na+ / K+ ATPase pump activity and increased mucosal permeability and altered membrane phospholipids. High mucosal concentration of lipid inflammatory mediators which stimulate chloride secretion in normal colon, Altered colonic motility and rapid transit time through the inflamed colon are the important causes. Prolonged transit times in small intestine can occur due to presence of active inflammation in the colon. Ulcerative colitis shows three important phases, active phase, remission phase and resolving phase on histology.

During active phase, in ulcerated regions there is full thickness loss of mucosawith the accompanying inflammation limited to the upper regions of the submucosa. Inflamed granulation tissue and a superficial layer of fibrinand neutrophils, covers the surface. In the non-ulcerated areas there is epithelial necrosis and intense mucosal capillarycongestion with some hemorrhage. Adiffuse increase in neutrophils, plasma cells and lymphocytes is seen in the laminapropria. The neutrophils predominate and invade the crypts to form crypt abscesses. They also penetrate the surface epithelium which is necrosed. The crypt abscessesalong with capillary engorgement is one of the earliest changes. The goblet cell population is reduced in active disease and the bases of the crypts show epithelial hyperplasia. The overall glandular pattern is considerably distorted. There may besubmucosal congestion and edema, but the muscularis and serosaare uninvolved [6].

In the resolving phase, the congestion diminishes and the gobletcell population is regenerated. Crypt abscesses disappear and lamina propria stillcontains increased numbers of inflammatory cells, they are not seen actively infiltrating the epithelium and glands. Re-epithelisation of the ulcer occurs and the crypts appear to regenerate with mild distortion. The infiltrate in the lamina propria lessens and during this stage may appear patchy [6].

In the phase of remission, epithelial continuity is restored and the inflammation resolves. The mucosa may show permanent signs of damage. Eventhough the goblet cell population is replinished, the neat regular parallelism of the glands is lost. There is often branching and shortening, with gap developing between the base of the gland and muscularis mucosae. Varying degrees of atrophy occur, andin extreme conditions, a single flat epithelium may constitute the whole thickness ofthe mucosa. Lymphoid hyperplasia is a prominent feature, which is often marked inrectum. The muscularis mucosae may occasionally be hypertrophic. Paneth cellmetaplasia is a common finding in chronic cases as is the presence of fat in the laminapropria [6].

Patients with ulcerative colitis (UC) face an increased risk for developing colorectal cancer. The risk increases with the duration of the disease and is greater inpatients with total or extensive colitis.

Crohn's disease is a chronic inflammatory disease of the digestive tract. Symptoms include abdominal pain and diarrhoea, sometimes bloody, and weight loss. Histology of Crohn's diseases is characterised by presence of small, multiple granulomas, foreign body type of giant cells and lymphocytic infiltrate in the mucosa and submucosa [7].

Objective

To know the histopathological distribution of inflammatory bowel diseases in teaching hospital. To determine the extent and severity (different phases) of ulcerative colitis.

Materials and Methods

Source of Data

With the permission of the local ethical committee, the present study was conducted in the Central laboratory, Department of Pathology, Kempegowda institute of Medical Sciences, Bangalore, during the period July 2010 to June 2013. One hundred and twenty colonoscopic biopsies from patients attending KIMS Hospital who mainly presented with lower gastrointestinal symptoms were studied. Clinical details, colonoscopic findings were obtained and maintained according to the proforma. Apparent pathology were noted during the colonoscopic procedure and biopsies taken from the respective representative areas as per discretion of the colonoscopist. For the retrospective cases all relevant details were obtained from previous hospital records. All the colonoscopic biopsies taken from terminal ileum to pectinate line of rectum, received in Central Laboratory KIMS,Bangalore were considered in the study. Tiny inadequate biopsies, biopsies from anal region were excluded.

Laboratory method

All the colonoscpic biopsy specimens were immediately fixed in 10% formalin for 24 hours. It was then routinely processed and embedded with the mucosal surface uppermost. Five microns thick serial sections were prepared and stained with Hematoxylin and Eosin. Detailed

study was performed under the light microscope. Adequacy of the biopsy was assessed and an attempt was made to correlate the histopathological diagnosis with colonoscopic diagnosis obtained.

Results

In the framework of study a total of one hundred and twenty biopsies were studied out of which 30 cases (20%) had inflammatory bowel disease. 28 cases of ulcerative colitis and 2 cases of Crohn's diseases were detected. In the present study, patients with IBD, presented mainly between age groups of 31- 50 years (Table 1). Females most commonly (60%) presented with IBD (Table 2).

Microscopy of IBD

As shown in Table 3, 28 Cases were diagnosed a Ulcerative colitis, of which, 19 cases were in the "active phase". The slides showed epithelial necrosis, distortion of glandular pattern, increase in the number of neutrophils, lymphocytes and plasma cells in the lamina propria, crypt abscesses, decrease in the number of goblet cells with the bases of the crypts showing epithelial hyperplasia.

3 Cases of Ulcerative colitis were in "resolving phase", characterized by distorted and branched crypts with a villous surface, regenerative hyperplasia of the base of crypts, restoration of goblet cell population, reduction in the inflammatory cell infiltrate with few polymorphs and/ or crypt abscess.

The remaining 5 cases of ulcerative colitis were in the "remission phase" where in the epithelial surface was flat, crypt atrophied and distorted, goblet cell population was normal. The lamina propria showed mild lymphoplasmacytic infiltrate. 1 case showed features of low grade dysplasia.

There were 2 cases of Crohn's disease in the present study and they were characterized by the presence of small, multiple granulomas, foreign body type giant cells and lymphocytic infiltrate in the mucosa and submucosa.

Table 1: Age distribution in cases of IBD

Age group	Ulcerative colitis	Crohn's colitis
21-30	5	1
31-40	7	1
41-50	7	-
51-60	4	-
61-70	5	-
Total	28	2

Table 2: Gender distribution in cases of IBD (Ulcerative colitis & Crohn's)

Gender	Number of cases	%
Male	12	40
Female	18	60
Total	30	100

Table 3: Case distribution in various phases of ulcerative colitis

Stage	Number of cases	%
Active	19	67.8
Remission	5	17.8
Resolving	3	10.7
With dysplasia	1	3.5
Total	28	100

Table 4: Showing comparison of Crohn's colitis with other study

Study	No. of cases of Crohn's colitis
Present study	2(2.3%)
Tendon et al(1972)[11]	10(8.2%)

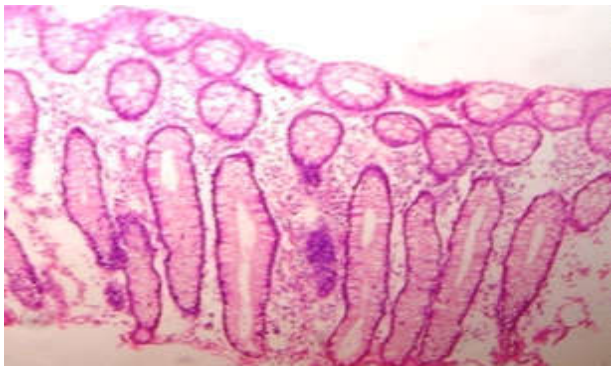

Fig. 1: Normal colonic mucosa

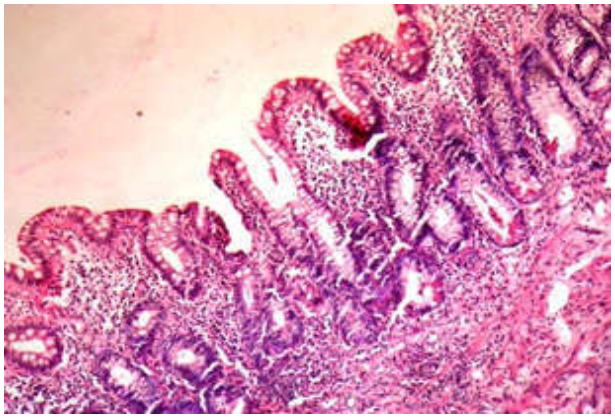

Fig. 2: Remission phase ulcerative colitis

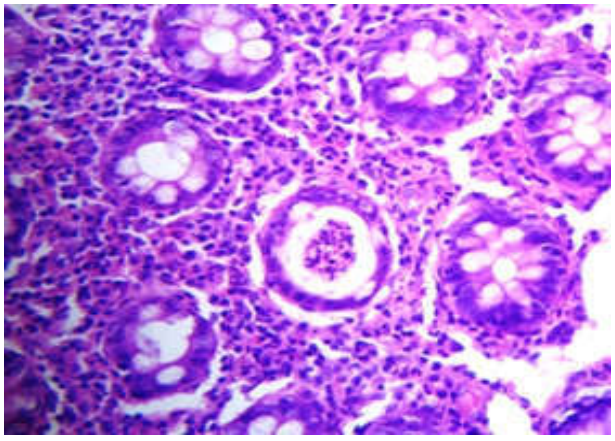

Fig. 3: Resolving phase ulcerative colitis

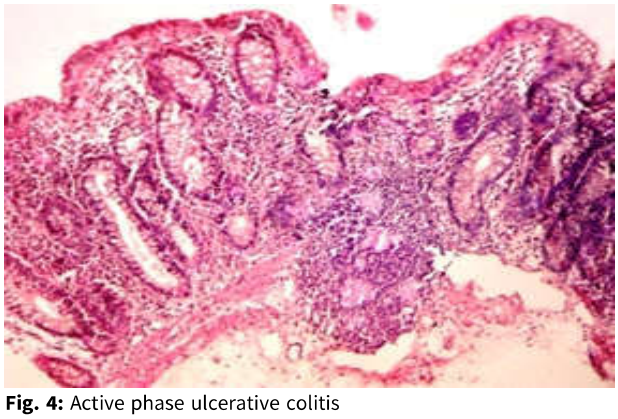

Fig. 4: Active phase ulcerative colitis

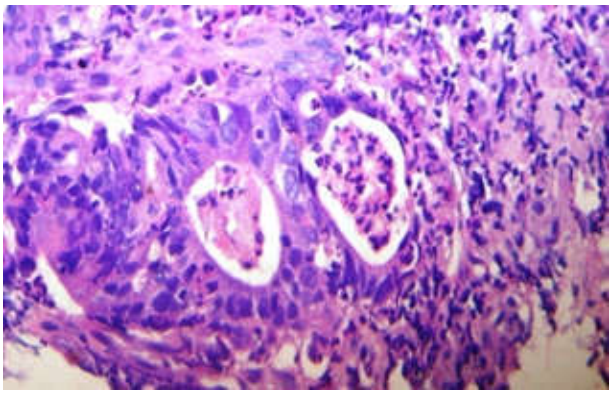

Fig. 5: Low grade Dysplasia in ulcerative colitis

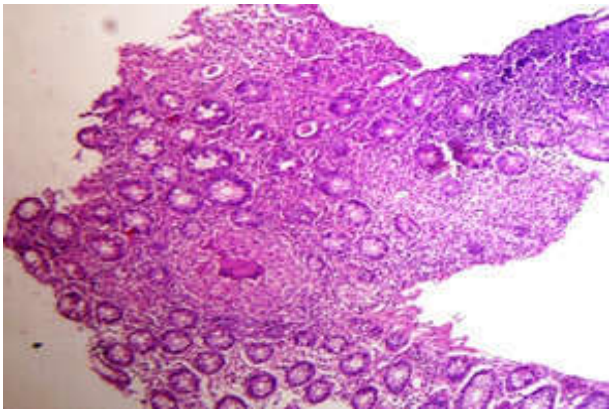

Fig. 6: Crohn's disease

Discussion

Dickinson et al [8] in their study of 74 cases described 11(14.9%) cases of ulcerative colitis. Flick et al [9] described 47 (28.1%) cases in his study of 167 cases.

Morson gave the peak incidence of ulcerative colitis as the third decade of life. He described it in a child of 3 weeks to patients over 50 years with predilection for females over males (3:2). Three phases were described as active phase, resolving phase and remission phase [10].

In the present study there were 28 (29.8%)of ulcerative colitis, with 19 of them in active phase (67.8%), 3 cases in resolving phase (10.7%), 5 cases in remission phase (17.8%) and 1 case with low grade dysplasia (3.5%). Cases were between the 31 to 50 with 7 in 4^{th} & 5^{th} decade, 5 in 3^{rd} & 7^{th} decade, 4 cases in 6^{th} decade. Maximum cases were females 18 (64.2%) and remaining 10 cases (35.8%)

There were 2 cases of Crohn's colitis in the present study. Tendon and Prakash et al [11] in their study of 121 cases described 10 cases of Crohn's disease and highlighted the importance of granulomas and distinguishing features of tuberculosis and Crohn's disease.

Gan et al in a study of 30 cases of Crohn's disease and 39 cases of intestinal TB on endoscopic biopsy reported that except for granuloma with caseation and confluence,

which was characteristic of TB, other pathological features of Crohn's disease and TB were similar [12].

Conclusion

Until the aetiology of Crohn's disease and ulcerative colitis are established, diagnosis must be based on histological criteria. At present it is only possible to make a final diagnosis of Crohn's disease or ulcerative colitis by either multiple colonoscopic biopsies or by histological assessment of resected bowel. Mucosal biopsy may be used to monitor the course after therapy and to estimate activity in cases of apparent remission or possible relapse of patients with ulcerative colitis.

Colonoscopic biopsy is useful in determining the distal extent of colonic disease in patients with Crohn's disease that require surgery and provides a more complete picture of segmental diseases that can be obtained by an inspection limited to the resection margins at operation. Definitive diagnosis of Intestinal tuberculosis (ITB) and CD is increasingly important, because Crohn's disease (CD) closely resembles ITB in clinical, radiological, endoscopic, and histological appearance. In the case of ITB misdiagnosis, unnecessary anti-tuberculosis therapy poses a risk of toxicity and delays the treatment of CD.

Conflict of Interest

The authors declare no conflicts of interest.

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