SHORT COMMUNICATION

Spectrum of chronic gastrointestinal diseases with final outcome in children at a tertiary care centre: A single-centre study

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Abstract

Chronic gastrointestinal (GI) diseases in children present with a wide range of symptoms. Limited resources in Paediatric Gastroenterology in developing countries like Pakistan cause considerable difficulties in managing children with chronic GI diseases in a timely fashion. This retrospective descriptive study aimed to determine the spectrum and outcomes of chronic GI diseases in children. The study was conducted at the Paediatric Gastroenterology and Hepatology Department, Pakistan Kidney and Liver Institute & Research Centre (PKLI &RC) in Lahore. The duration of the study was from August 2019 to August 2020. A total of 40 children below the age of 15 years with chronic GI diseases were included. The diagnosis was principally established with the assistance of esophagogastroduodenoscopy and ileo-colonoscopy.

Coeliac disease was the most common chronic GI disease. Our systematic approach, in addition to an extensive workup, assisted in the diagnosis and management of the illness, which resulted in a more optimal outcome. Prompt referrals to tertiary centres are recommended where facilities and expertise are available to decrease morbidity and mortality.

Keywords: Children; Chronic gastrointestinal diseases; Coeliac disease.

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Introduction

Chronic gastrointestinal (GI) diseases cause a variety of symptoms in children, such as abdominal pain, bloating, vomiting, diarrhoea, constipation, and weight loss. Due to a lack of facilities and expertise in the field of Paediatric Gastroenterology, especially in developing countries such as Pakistan, it is challenging to investigate and treat such diseases in children in a timely manner, due to which both morbidity and mortality increase in children. This article explains the systematic approach that was used to diagnose chronic GI diseases accurately. The approach consists of taking a detailed history and conducting a thorough clinical examination followed by appropriate investigations so that suitable treatment can be initiated to improve the outcome.[1] Coeliac disease was noted to be the most common GI disease.

Patients/Methods/Results

This retrospective descriptive study was conducted at the Paediatric Gastroenterology and Hepatology Department, PKLI &RC in Lahore, Pakistan, from August 2019 to August 2020. A total of 550 children with chronic liver disease (CLD) and chronic GI diseases were seen during this period. Of these, the majority were of CLD as the institute principally takes referrals for CLD and liver transplant, if needed. A total of 40 children below the age of 15 years with chronic GI diseases were seen and, hence, were included in this study. The referrals were received from primary and secondary health care centres in different parts of the country. Clinical notes were analysed in relation to the clinical history, examination, investigations, and treatment, and subsequently, the outcome was evaluated. The data was collected from the electronic medical records database and incorporated into a spreadsheet for analysis. The statistical analysis was performed by applying t-test with p value determined. Verbal consent was taken from the patients' parents.

The diagnosis was principally established with the assistance of esophagogastroduodenoscopy and ileo-colonoscopy.

Of the 40 children, 16 (40%) were diagnosed with coeliac disease, 7 (17.5%) with H. pylori gastritis, 6 (15%) with (UC), 5 (12.5%) with (LC), 3 (7.5%) with (EC), 1 (2.5%) with (CD), 1 (2.5%) with (IT), and 1 (2.5%) with (IL).

The study population was classified into three age groups: children aged one to five years (n=1), children aged five to 10 years (n=12), and children aged 10 to 15 years (n=27). The male-to-female ratio was 1.5:1. The mean age of the overall study population was 10.5±2.87 years. We further categorised the mean age for each chronic GI disease. The mean age for children with coeliac disease was 9.0±3.6 years, children with UC had a mean age of 11.0±1.3 years, LC children had a mean age of 12.0±1.87 years, and the mean age of children with H.

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Table-3: Initial laboratory tests performed in children with H. pylori gastritis, LC, UC, CD, IL and IT. Mean value also shown for H. Pylori, LC and UC.

Variables	H. pylori (n):7 gastritis (Mean)	LC(n): 5 (Mean)	UC(n):6 (Mean)	IL(n):1	CD(n):1	IT(n):1
Hb (11-17 g/dL)	12	12.5	11.5	11	13	8.5
WCC (4-10×10^3 u/L)	7.8	8.7	6.4	4	7	20
L (1-3×10^9/L)	2	2.5	2.5	0.75	2.7	2.1
N (2-7×10^9/L)	4.4	6.8	4.4	3	6	10
E (0.02-0.5×10^9/L)	0.16	0.07	0.4	0.08	0.1	0.27
Platelets (150-450)	372	265	272	275	536	525
ESR (0-15) mm/hour	-	11	12	10	17	80
CRP (0-0.5 mg/dL)	-	0.3	0.3	0.3	0.2	50
Albumin (3.5-5 g/dL)	4.0	3.9	3.8	2	4.2	1.8

pylori was 11.0±2.16 years. The ages of children with CD, IT, IL, and EC were 14, 12, five, and seven years respectively.

A variety of GI diseases were diagnosed based on routine baseline laboratory investigations, and with the assistance of esophagogastroduodenoscopy (EGD) and ileo-colonoscopy in all 40 children as shown in Table 1 and Figure 1, respectively.

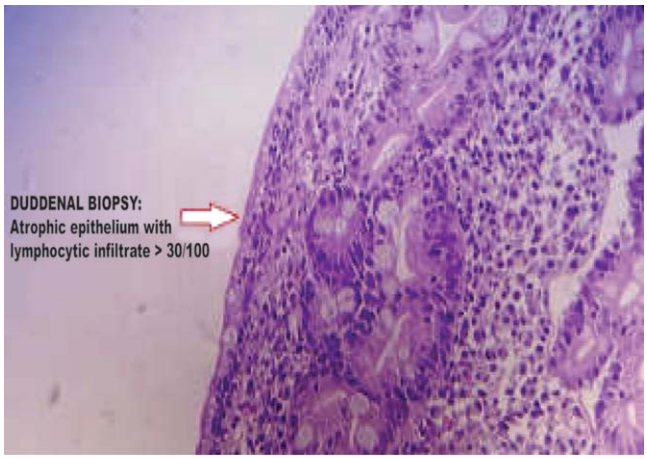

Figure-1: Duodenal biopsy in a 10-year-old child confirming Coeliac disease.

Table-1: Investigations for chronic gastrointestinal diseases in children.

Investigations	Chronic gastrointestinal diseases
CBC	Coeliac disease, IBD, IT, IL, EC, H. pylori gastritis
LFTs	Coeliac disease, IBD, IT
Coeliac screen (Anti TTG level)	Coeliac disease
CRP	CD, UC, IT
ESR	IBD, IT
Upper GI endoscopy	Coeliac disease, IBD, IL, H. pylori gastritis
Ileo-colonoscopy	IBD, IT, EC, LC

CBC, complete blood count; LFTs, liver function tests; Anti TTG, anti-tissue transglutaminase; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate.

Table 2 shows the mean and p-value of pre- and post-treatment levels in haemoglobin, anti TTG in children with coeliac disease and eosinophilic count for EC after commencing them on appropriate treatment.

Table-2: Mean and P-value of pre and post treatment levels of anti- TTG, & haemoglobin for coeliac disease and eosinophilic count for eosinophilic colitis.

Variables	Mean	P- Value
Anti- TTG Pre treatment	227.76 (±93.19)	<0.05
Anti- TTG Post treatment	14.11 (±4.58)	
Haemoglobin Pre treatment	10.11 (±0.68)	<0.05
Haemoglobin Post treatment	11.95 (±0.41)	
Eosinophil Pre treatment	1.0000 (±0.16)	<0.05
Eosinophil Post treatment	0.2050 (±0)	

Table 3 reveals the investigations performed for H. pylori gastritis, LC, IT, UC, CD and IL. Improvement in albumin and lymphocyte counts was observed in the child with IL.

The erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), white cell count (WCC), haemoglobin and albumin in a child of IT normalised after starting anti-tuberculous treatment. Routine blood test results were unremarkable for children with H. pylori gastritis, UC and LC. The child with CD had a high platelet count only which became normal after treatment. The EGD assisted with the confirmation of cases of coeliac disease, H. pylori gastritis, and IL, while the ileo-colonoscopy confirmed the presence of LC, IT, CD, UC, and EC.

Discussion

In the article we adopted a systematic approach to diagnose and manage a variety of chronic GI diseases in children. Coeliac disease, the most common entity was diagnosed by noting down its classic symptoms, i.e. chronic watery diarrhoea, abdominal pain, high anti-TTG level, and performing conclusive duodenal biopsies as shown in Figure 2.

A study in Pakistan by Hussain et al confirmed coeliac disease in children with the help of coeliac screening only.[2] In the current study, only duodenal biopsies were performed on all symptomatic children with high anti-TTG level because of resource constraints in our institute

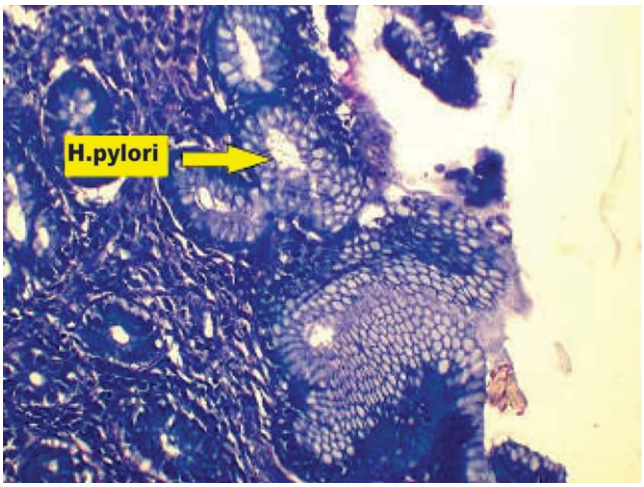

Figure-2: Gastric antrum biopsy in a 7-year-old boy confirming H. pylori.

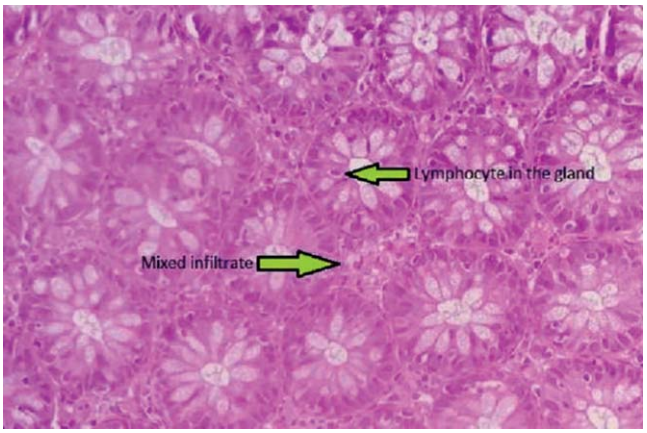

Figure-3: Colonic epithelium with mixed infiltrate in lamina propria and glands are infiltrated by mature lymphocyte.

to cater for HLA genetic testing for coeliac disease.[3] All the patients became asymptomatic after adhering to a gluten-free diet for 3-6 months.[4]

The parents were asked to arrange screening serology tests on siblings but due to lack of finances they could not be performed.

Other diseases such as Helicobacter pylori (H. Pylori) gastritis, lymphocytic colitis (LC), ulcerative colitis (UC), eosinophilic colitis (EC), Crohn's disease (CD), intestinal tuberculosis (IT), and intestinal lymphangiectasia (IL) were also picked up with the help of EGD and Ileo-colonoscopy.

H. Pylori is the most common cause of acquired peptic ulcer disease in children. The diagnosis is usually confirmed with EGD and biopsies.[5] The patients presented with symptoms of dyspepsia, and after confirmation with EGD and biopsies, as observed in Figure 3, all children completely recovered with the assistance of a triple eradication treatment (Amoxicillin, Clarithromycin, and Omeprazole) administered for 14 days.

Figure-4: Colonic mucosa biopsy in a 7-year-old girl confirming eosinophil colitis.

Lymphocytic colitis (LC) is a type of microscopic colitis which is very rare in children. It connects chronic diarrhoea with intraepithelial lymphocytosis or accumulation of sub-epithelium collagen (collagenous colitis).[6] After confirmation on colonic biopsies, as shown in Figure 4, the affected children improved on administration of Mesalazine for almost six months.

Children suffering from Eosinophilic colitis (EC) presented with abdominal pain and bloody diarrhoea. The EGD was normal, but colonic biopsies revealed inflammation as shown in Figure 5 with high eosinophil count.[7]

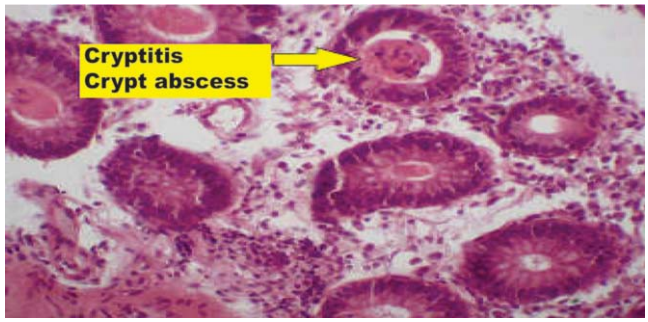

Figure-5: Colonic mucosa in a ten-year-old boy showing features of ulcerative colitis.

Children exhibited an excellent response to a dairy-free diet and steroids administered for three months. They remained in remission with 4mg Montelukast daily.

IBD comprises Crohn's disease (CD) and ulcerative colitis (UC) of unknown aetiology. CD is a chronic, idiopathic transmural inflammation that can affect any part of the GI system. UC is a chronic idiopathic mucosal inflammation involving the colon.[8] In this study, children with UC were

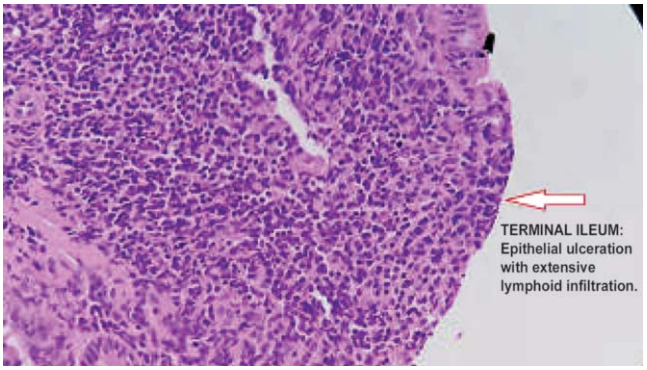

Figure-6: Terminal ileum biopsy in a 14-year- old girl suggesting Crohn's disease.

classified as having mild or moderate disease depending on the severity of diarrhoea, abdominal pain, and colonoscopy and biopsy findings as observed in Figure 6.

Symptoms were ameliorated by mesalazine, which was administered for mild disease, but for moderate disease, steroids were effective.

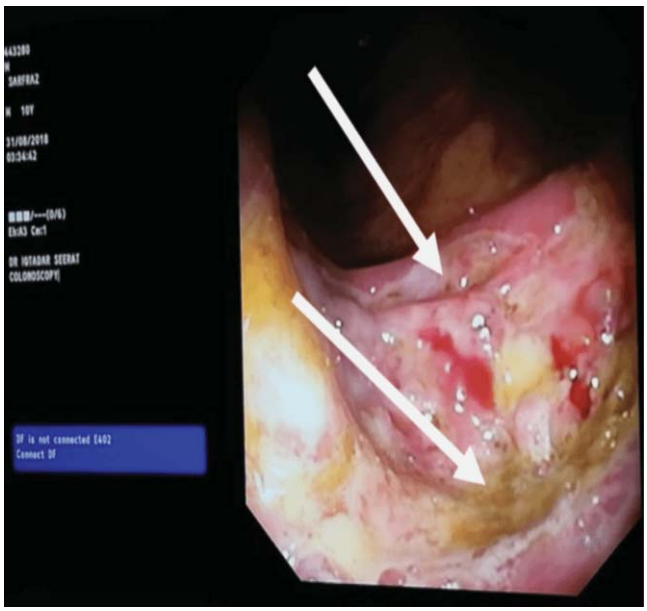

Figure-7: Colonoscopy showing terminal ileum mucosa in a 10-year-old boy showing circumferential ulcers and marked inflammation suggesting tuberculosis.

In the case of CD, the ileo-colonoscopy revealed an inflamed, erythematous mucosa with aphthous ulcers in the entire colon and terminal ileum.[9] The terminal ileum biopsy as in Figure 7 revealed epithelial ulceration with extensive lymphoid infiltration.

After steroids were administered for an induction phase, the patient went into remission, and she currently takes Azathioprine only.

The ileo-colonoscopy in the intestinal tuberculosis (IT)

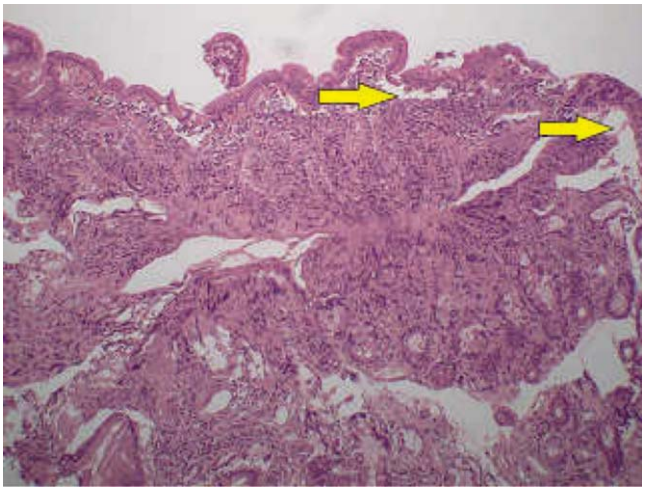

Figure-8: Duodenal biopsy in a 5-year-old boy showing dilated lymphatic vessels in favour of intestinal lymphangiectasia.

patient showed patchy involvement of the colon and circumferential ulcers in the ileo-caecal region, as in Figure 8. He has improved after the commencement of anti-tuberculous treatment.[10]

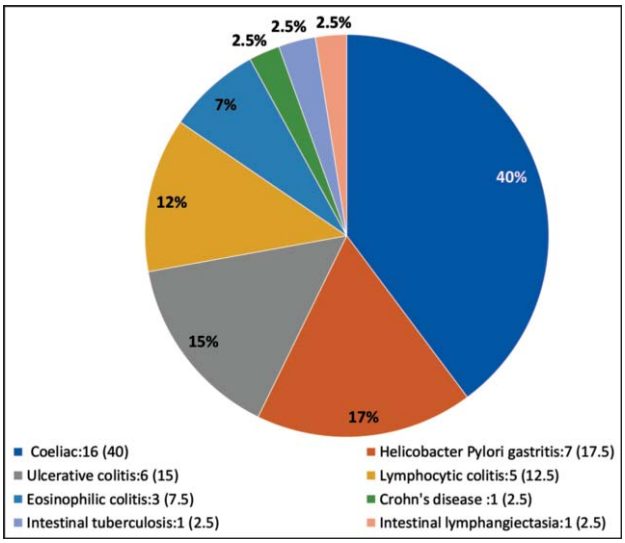

Figure-9: Forty children were diagnosed with gastrointestinal diseases with the assistance of esophagogastroduodenoscopy and ileo-colonoscopy.

Intestinal lymphangiectasia (IL) is a rare disease caused by the dilatation of intestinal lymphatics. Laboratory tests of the child showed low albumin and lymphopenia. Macroscopically, white spots were seen over mucosa in the small intestine during EGD, and biopsies were conclusive, as shown in Figure 9.

His symptoms resolved after the intake of a low-fat diet with fat-soluble vitamins and medium-chain triglycerides.[11]

Children from all eight groups showed good outcome with the help of appropriate investigations and treatment offered. No mortality and morbidity was noted in the follow-up of these patients.

Conclusion

Coeliac disease was the most common ailment among children with chronic GI diseases who were referred to our hospital. There is an urgent need to educate health professionals at both the primary and secondary levels. Referring these patients to tertiary centres so they could quickly be managed with the help of available resources and expertise in order to reduce both morbidity and mortality, and thus, obtain a satisfactory outcome.

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Conflict of Interest: None to declare.

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