

## ORIGINAL ARTICLE

# Chronic Diarrhea in Children: Experience at A Tertiary Hospital of Bangladesh

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### Abstract

**Background:** Chronic diarrhea is insidious onset that persists for 14 days and more, usually of noninfectious origin. Chronic diarrhea in children is not an uncommon problem in our country.

**Objectives:** Objective of this study was to evaluate children with chronic diarrhea by clinical-biochemical profile and outcome.

**Methods:** It was a retrospective observational study done in the department of paediatric gastroenterology and nutrition, BSMMU. The study was done during January 2017 through December 2018. Forty-five patients diagnosed as chronic diarrhea between the ages of 6 months to 18 years were included in this study. We Clinical, laboratory data and outcome of patients were analyzed.

**Results:** Mean age of children was  $5.96 \pm 2.3$  year, 60% (27) were male and 40% (18) were female. Among them under 5 years were 55% (25). All children presented with diarrhea (100%) along with fever (24%), FTT (22%), abdominal pain (20%) and weight loss (20%). About 58% of children had anemia and 14% had hepatomegaly and/or splenomegaly. Raised ESR (40%), leukocytosis (20%), thrombocytosis (16%), raised CRP (13%) and electrolyte imbalance (16%) were observed. Intestinal TB (18%) was the most common etiology of chronic diarrhea. Moreover, chronic constipation with fecal incontinence mimicking diarrhea (11%), IBD (9%), coeliac disease (8%), IBS (7%), HIV enteropathy (4%), primary immunodeficiency disorder (4%) were also found. Improvement of diarrhea was observed in 96% children, 4% patient died due to diarrhea-related complications.

**Conclusion:** Chronic diarrhea in children is not uncommon in Bangladesh and diagnosis of etiologies are challenging. Intestinal tuberculosis found to be an important cause of chronic diarrhea in this study. Although in the majority of the cases, etiology could not be identified, some remote etiologies were found on this study, like chronic constipation with fecal incontinence mimicking diarrhea, IBD, HIV enteropathy, primary immunodeficiency.

**Keywords:** Chronic diarrhea, children, intestinal TB, immunodeficiency disorder.

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## Introduction

Diarrhea is one of the most common causes of morbidity and mortality in children worldwide.<sup>1</sup> In clinical terms, diarrhea refers to either an increased stool frequency or a decreased stool consistency, typically a watery quality. The World Health Organization (WHO) defines a case of diarrhea as the passage of three or more loose or watery stools per day. Diarrhea is also defined as stool volume >10 g/kg per day in infants and toddlers, and >200 g/day in older children. Most acute diarrheal episodes subside by 7 days; few last up to 14 days.<sup>2,3</sup> Persistent diarrhea is an episode of diarrhea, which starts acutely, usually of infectious etiology and lasts for 14 days or more.<sup>4-6</sup> Chronic Diarrhea is one, which has insidious onset that persists for 14 days or more and usually of non-infectious origin.<sup>7</sup> Diarrheal illnesses are estimated to be responsible for approximately 2 to 4 million-childhood death worldwide each year.<sup>3,8</sup> In 2002, the WHO estimated that 13.2% of all childhood deaths were due to diarrheal diseases, 50% of which were from chronic diarrheal illnesses.<sup>4</sup> Persistent diarrhea may lead to fatality in 60% cases due to its difficult treatment and higher cost.<sup>3</sup> Large-scale studies indicated that the prevalence of chronic diarrheal illnesses ranges from 3% to 20%, and the incidence is approximately 3.2 episodes per child per year.<sup>9,10</sup> Chronic diarrhea is also a major problem in our country.<sup>11</sup>

## Materials and Methods

It was a retrospective observational study done in the department of pediatric gastroenterology and nutrition, BSMMU. The study was done from January 2017 to December 2018. Patients diagnosed as chronic diarrhea between the ages of 6 months to 18 years were included in this study. We analyzed clinical, laboratory data and outcome of patients. Patients with incomplete data were excluded from this study. A total of 45 patients were included in this study. We aim to evaluate children with chronic diarrhea by clinical biochemical profile and outcome in hospitalized children. Clinical history, relevant clinical examination findings, investigation reports, diagnosis and treatment history were recorded in a pretested datasheet specially designed for the study.

## Results

Mean age of children was 5.96 year. Among them 60% (27) were male, and 40% (18) were female. Under 5-year children were 55% (Table I).

Demographic characteristics	No of patients	Percentage
Sex		
Male	27	60.0
Female	18	40.0
Age		
6mo-1y	7	15.6
>1y-3y	17	37.8
>3y-5y	3	6.7
>5y-10y	3	6.7
>10y	10	22.2

All the patients had diarrhea in common. Besides, 24.4% (11) of them complained about fever. In addition, 20% (9) of them had abdominal pain and complaint of weight loss (Table II).

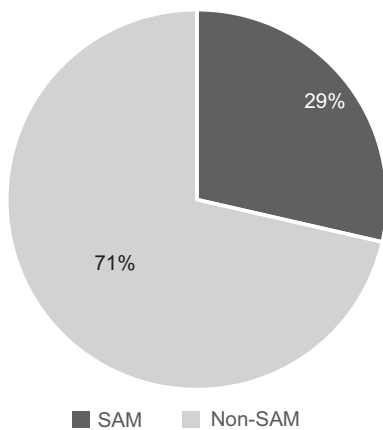
Presenting complaints	No of patients	Percentage
Diarrhea	45	100.0
Fever	11	24.4
Abdominal pain	9	20.0
Weight loss	9	20.0
Vomiting	8	17.8
Edema	5	11.1
Abdominal distension	5	11.1
Blood mixed stool	1	2.2
Skin lesion	1	2.2

On examination, most of them were anemic (57.8%, n=26). Failure to thrive was also common (22.2%, n=10). Organomegaly (hepatosplenomegaly) observed in a few of the patients along with ascites (Table III).

**Table III**  
*Physical findings (N=45)*

Physical findings	No of patients	Percentage
Anemia	26	57.8
FTT	10	22.2
Hepatosplenomegaly	4	8.9
Hepatomegaly	2	4.4
Ascites	2	4.4
Rickets	1	2.2

Severe acute malnutrition was not much prevalent in the studied children who were aged under 5 years (29%, 10 out of 35 children) (Fig. 1).



**Fig 1** Distribution of severe acute malnutrition in under 5 children (N=35)

Laboratory investigations revealed the presence of anemia in 57.8%(26) children. Raised ESR, leukocytosis, and thrombocytosis were found in addition. Electrolyte imbalance was found in 15.6%(7) cases (Table IV).

**Table IV**  
*Laboratory findings (N=45)*

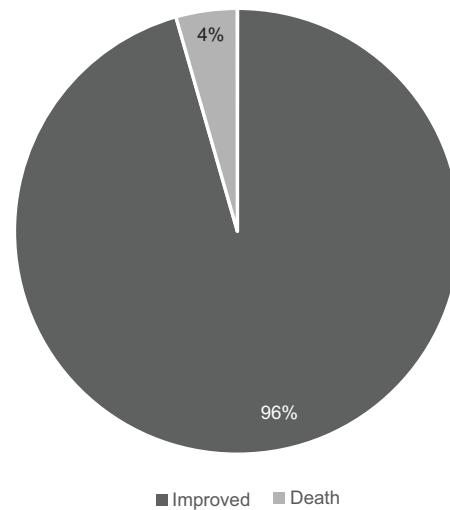
Laboratory findings	No of patients	Percentage
Anemia	26	57.8
Raised ESR	18	40.0
Leukocytosis	13	28.9
Thrombocytosis	7	15.6
Raised CRP	6	13.3
Electrolyte imbalance (hypokalemia/hyponatremia)	7	15.6
Stool R/M/E (pus cell+/- RBC)	6	13.3
Stool C/S growth	0	0.0

Around 31.1%(14) cases remained undiagnosed in time of discharging from the hospital. Known diagnosis included intestinal tuberculosis, chronic diarrhea, and other forms of abdominal diseases (Table V).

**Table V**  
*Diagnosis (N=45)*

Diagnosis	No of patients	Percentage
Undiagnosed	14	31.1
Intestinal TB	8	17.8
Chronic constipation with fecal soiling mimicking diarrhea	5	11.1
IBD	4	8.9
Coeliac disease	3	6.7
IBS	3	6.7
HIV enteropathy	2	4.4
P. Immunodeficiency	2	4.4
GSD	1	2.2
Acrodermatitis enteropathica	1	2.2
Cystic fibrosis	1	2.2
Short bowel syndrome	1	2.2

Only 4%(2) children died during hospitalization. Rest of the children's condition improved and been discharged (Fig. 2).



**Fig 2** Outcome of the patients (N=45)

**Table VI**  
*Aetiological comparisons of different studies*

Present study	Shenoy et al <sup>14</sup> n=50	Altunaset al <sup>16</sup> n=70	Rastogi et al <sup>17</sup> n=47	Yachha et al <sup>18</sup> n=137	Lee et al <sup>19</sup> n=27
Chronic constipation with fecal soiling mimicking diarrhea-11.1%	Post infectious-10%	Post-infectious 10% Other infections-4.2%	Tropical enteropathy 47%	Protracted diarrhea 33%	
Primary Immunodeficiency 4.4%					
Intestinal tuberculosis-17.8%	Parasitic-0	Parasitic-19%	Parasitic-15%	Parasitic-9%	Parasitic-26%
IBD-8.9%	Celiac-12%	Celiac-30%	Celiac-7%	Celiac -26%	CMPI-29%
Coeliac disease-6.7%	CMPI -62%	CMPI-17%	IBS-11%	CMPI- 6%	Sec. lactose intolerance 19%
	TB-2%			TB-5%	
IBS-6.7%	IBD-2%				
GSD-2.2%	Nonspecific 2%	Cystic fibrosis-10%	NON-SP- 22%	OTHERS-8%	Lymphangiectasia-7%
Acrodermatitis enteropathica-2.2%	Lymphangiectesia-4%			Cystic fibrosis	Glucose galactose malabsorption-7.5%
Cystic fibrosis-2.2%	Cystic fibrosis- 2%			Acrodermatitis enteropathica	
Short bowel syndrome-2.2%	Glucose galactose malabsorption-4%				
Unknown-31.1%	Unknown-nil	Unknown-10%	Unknown-nil	Unknown-13%	Unknown-11%

## Discussion

Diarrhea is commonest of the diseases that cause morbidity and mortality in children.<sup>1</sup> Over 6 billion children suffer from diarrhea worldwide, and around 1.7 billion of them are from Southeast Asia.<sup>1,6</sup> In Bangladesh, Islam et al<sup>12</sup> in 2018, conducted study in DMCH and ICDDR,B they targeted the under 5 year children, as this group was more vulnerable to diarrhea and found 6.4% were Persistent diarrhea. Chronic diarrhea has a broad etiological pattern and includes a number of heterogeneous conditions with a different course. But there is no study in Bangladesh regarding chronic diarrhea. This study aimed to observe the demography, clinical profile, diagnosis, and outcome of chronic diarrheal illness within a year span in BSMMU.

The mean age of children was found in this study was around 6 years. Mahfuz et al<sup>13</sup> in 2017 found the mean age 4.5 years. Male children (60%) were prevalent than female (40%) with a male-to-female ratio of 1.5:1 and under 5-year children were common

(55%). Shenoy B et al<sup>14</sup>, 2018 found, 86% of children were <5 years and 14% beyond 5 years of age. The number of more male children than female children reflected the social norms of our country. Male children get more attention and thus taken to hospital.<sup>15</sup>

All the patients had diarrhea, along with fever (24.4%), abdominal pain (20%), and complaint of weight loss (20%). Shenoy et al<sup>14</sup>, showed 26% cases had a fever, weight loss, and abdominal pain associated in their study.

On examination, most of them were anemic (57.8%), and failed to thrive (22.2%). Hepatosplenomegaly was observed in a few of the patients (8.9%) along with ascites (4.4%), rickets 2.2%. Shenoy et al<sup>14</sup>, found anemia 32%), vitamin D deficiencies 6%, hepatomegaly 10%, splenomegaly 2% and ascites with pedal edema 2%.

Severe acute malnutrition was 28.6% in the studied children who were aged under 5 years. Persistent diarrhea showed a clear relevance with malnutrition,

established by several researchers. Shenoy et al<sup>14</sup> found 12% malnutrition in chronic diarrhea.

Laboratory investigations revealed the presence of anemia (57.8%), raised ESR (40%), leukocytosis (28.9%), and thrombocytosis (15.6%). Electrolyte imbalance was found in a few cases (15.6%). Stool culture in this study revealed no presence of infectious agents. Shenoy et al 2018, found 10% cases were post-infectious.<sup>15</sup>

Around 31.1% (14) cases remained undiagnosed in time of discharging from the hospital. Known diagnosis included intestinal tuberculosis (17.8%), Chronic constipation with fecal soiling mimicking diarrhea (11.1%), IBD (8.9%), Coeliac disease (6.7%), IBS (6.7%), HIV enteropathy (4.4%), primary Immunodeficiency (4.4%), GSD (2.2%), Acrodermatitis enteropathica (2.2%)<sup>14</sup>, Cystic fibrosis (2.2%), Short bowel syndrome (2.2%). Shenoy et al 2018 found 62% cow milk protein intolerance (CMPI), 12% celiac disease, 10% post-infectious, 4% glucose-galactose intolerance, 2% non-specific, 2% cystic fibrosis, 2% IBD, TB 2% and 4% lymphangiectasia. Other study found, functional diarrhea (28%), IBD(24%), celiac disease (8%), post enteritis diarrhea (8%), alimentary allergy (14%), infectious diarrhea (8%), congenital diarrhea (1%), no diagnosis (9%).<sup>20,21</sup> In the present study, most of the children were improved (95.6%) and been discharged and 4.4% have died.

This is the first-ever study in Bangladesh regarding chronic diarrhea in children. The etiological pattern of chronic diarrhea in Bangladesh was not known. This study adds valuable information about etiology and demographic variants. Larger sample size and multicenter study are required to find out other causes of chronic diarrhea. Investigation facilities are needed to be made available for proper diagnosis.

### Conclusion

Chronic diarrhea in children is not uncommon in Bangladesh and diagnosis of etiologies are challenging. Intestinal tuberculosis found to be an important cause of chronic diarrhea in this study. Although in the majority of the cases, etiology could not be identified, some remote etiologies were found on this study, like chronic constipation with fecal incontinence mimicking diarrhea, IBD, HIV enteropathy, primary immunodeficiency.

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