

Paediatric Chronic Diarrhoea: Approach in Resource-limited Settings

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Abstract

Background: Aetiology of paediatric chronic diarrhoea in the resource-limited countries with special reference to the Indian sub-continent is at remarkable variance with that of Western countries.

Aims and Objectives: To present a diagnostic and therapeutic approach that is most relevant in resource-limited situations about chronic diarrhoea in children with inputs from the English medical literature.

Salient Features: Malnutrition in different forms, including iron-deficiency anaemia, and intestinal parasitic infestations, especially giardiasis and ancylostomiasis rule the roost. Celiac disease, cystic fibrosis, inflammatory disease, short bowel syndrome, functional disorders, etc. do occur but do not occupy the top spot. The general clinical, investigative and therapeutic approach is, therefore, at variance with that followed in the West.

All children with chronic diarrhoea in whom history and clinical examination fail to point out a specific pathologic condition such as celiac disease, cystic fibrosis, short bowel syndrome, inflammatory bowel disease, functional conditions, excessive consumption of beverages such as juices and soft drinks, etc. should be evaluated and treated for malnutrition and worm infestations. If no response to treatment, they should be investigated for other disorders as per a protocol that needs to be modified according to the individual merits of a case.

Keywords: *Ancylostomiasis; Chronic Diarrhoea; Celiac Disease; Crohn Disease; Cystic Fibrosis; Functional Diarrhoea; Giardiasis; Inflammatory Bowel Disease; Short Bowel Syndrome; Steatorrhoea; Ulcerative Colitis*

Introduction

Currently, chronic diarrhoea, a common problem, is defined as a diarrhoea of more than 2 weeks duration [1-5]. It differs from persistent diarrhoea in as much as that significant malabsorption is its predominant feature [2].

Aetiology of paediatric chronic diarrhoea in the Indian subcontinent is at variance with that of Western countries [6-11]. Malnutrition in different forms, including iron-deficiency anaemia, and intestinal parasitic infestations, especially giardiasis and ancylostomiasis rule the roost [1,2]. Much too much consumption of juices and soft drinks is a common cause. Celiac disease, cystic fibrosis, inflammatory bowel disease, small bowel syndrome, functional disorders, etc. do occur but do not occupy the top spot. The general clinical, investigative and therapeutic approach is, therefore, at variance with that followed in the West.

This review, based on our own experience of over four decades with inputs from the literature proposes to put forward a clinical, investigative and therapeutic approach for paediatric chronic diarrhoea in the Indian subcontinent.

Aetiological considerations in India

Generally speaking, aetiology of chronic diarrhoea in children in India is more or less on the lines shown in Table 1.

A. Common Conditions
1. Protein-energy malnutrition
2. Iron-deficiency anaemia
3. Giardiasis
4. Ancylostomiasis
5. Excessive consumption of juices and soft drinks
6. Cow milk allergy
B. Not So Common Conditions
1. Celiac disease
2. Cystic fibrosis
3. Endemic tropical sprue
4. Inflammatory bowel disease
5. Irritable bowel syndrome
C. Infrequent conditions
1. Surgical conditions: Short bowel syndrome

Table 1: Overview of the aetiology of chronic diarrhoea in children in India.

Diagnostic considerations [2,3]

History

- A carefully taken, good history is important. Most valuable pointers and clues are likely to be obtained from answers to the following questions:
- Did the symptoms appear early in infancy (cystic fibrosis) or after the first six months of life subsequent to the introduction of semisolids (coeliac disease)?
- Any relationship between onset of symptoms and introduction of supplementary milk feeds (lactose intolerance) or cereals (coeliac disease)?
- Any family history of chronic diarrhoea (cystic fibrosis, coeliac disease, hereditary lactose intolerance)?
- Is there any history of intolerance to an item of food, i.e. wheat, barley, rye, oat (celiac disease) or milk (lactose intolerance)?
- Was the child failing to thrive from early infancy or started suffering from growth failure after introduction of a solid food (coeliac disease)?

- How is the child's appetite? Generally, it is increased in (cystic fibrosis) and in some children suffering from giardiasis. In coeliac disease, it is invariable poor.
- Does the child eat like a glutton but, despite all that, he has not been thriving well? This strongly suggests cystic fibrosis, especially when there is a history of concurrent recurrent respiratory infections. Voracious appetite may occur in a small proportion of cases of giardiasis.
- What is the naked eye appearance of stools? Large, pale, frothy and very foul-smelling stools are highly suggestive of steatorrhea.
- Stools with apparent oily matter point to pancreatic disease (usually cystic fibrosis) Characteristically white, fatty stools with plenty of undigested material are most often a feature of giardiasis.
- Was the prolonged diarrhoea preceded by an attack of acute gastroenteritis? The situation is highly indicative of secondary lactose intolerance. This condition is fairly common and the stools in it are watery, profuse, accompanied by excess of flatus and have extremely foul smell. The perianal area appears raw and red in a large majority of these children.
 - Is it persistent/recurrent bloody diarrhoea or rectal bleed, usually with pain abdomen (inflammatory bowel disease).
 - Any associated psychosomatic background (irritable bowel syndrome).

Physical examination

- Assessment of the nutritional status is paramount.
- Growth parameters to determine presence of short stature.
- Presence of anemia, its magnitude, skin pigmentation, atrophic tongue.
- Presence of deficiency signs.
- Any nasal polyp, rectal prolapse.
- Respiratory system.

Investigations

- **Stool microscopy:** Microscopic examination of stools for evidence of parasitic infestations is of definite value. At least three meticulous stool examinations on successive days are essential before one rules out the presence of intestinal infestation. The presence of numerous large fat globules, after staining with Sudan-3 or eosin, is indicative of steatorrhea. However, this is a rough screening test
- **Daily stool fat:** Chemical examination of stools for fat content is the next important investigation. A fat excretion of more than 5 g/24 hours is regarded as indicative of steatorrhea. Stool fat can also be measured by a semiquantitative simple, cheap and accurate method, steatocrit. It is a method of microcentrifugation of fecal homogenate.

- **D-xylose test:** A child with steatorrhea but normal D-xylose test is said to be suffering from steatorrhea of non-enterogenous (usually pancreatic) origin as is the case with cystic fibrosis and, in our experience, frequently with giardiasis also.
- **Endoscopic jejunal biopsy:** In view of the nonspecific results obtained from this investigation, its use may be reserved for difficult cases. Only in a few conditions like intestinal lymphangiectasia, abetalipoproteinemia, amyloidosis and intestinal lymphoma is the intestinal histology pathognomonic. In celiac disease, endemic tropical sprue, protein-energy malnutrition (PEM), iron deficiency anaemia (IDA) and ancylostomiasis, similar types of villous atrophy occur and differentiation on the basis of histologic changes is nearly impossible.
- **Radiology:** Barium meal examination, using a non-flocculable medium may reveal abnormalities like intestinal dilatation, flocculation, segmentation and atypical mucosal pattern. These are indicative of malabsorption but fail to differentiate one condition from another, especially the ones that are responsible for most of the tropical malabsorption in infants and children. This investigation is of value in detecting anatomic defects.
- **Other investigations:** Schilling test, sweat chloride estimation, tryptic activity, lactose tolerance test, etc. may be performed under special circumstances, depending on the individual merits of a case. These, like jejunal biopsy and radiology, need not be done in every child suffering from chronic diarrhoea/malabsorption.

To cut the long story short, box 1 presents four steps of evaluating paediatric chronic diarrhoea which is liable to modifications depending on the merit of individual cases.

Notwithstanding the fact that the list of causes responsible for malabsorption is rapidly expanding [11] in practice only a few of the conditions appear to monopolize the situation. In our experience, stool fat signifying mild to moderate steatorrhea is usually indicative of PEM, IDA or intestinal parasitic infestation. Gross steatorrhea is generally due to CF, CD or tropical sprue.

The diagnosis of CF is best confirmed by sweat chloride estimation (sweat chloride is very high in this condition, always above 60 mEq/L) and tryptic activity.

A patient with gross steatorrhea, in whom the diagnosis of CF has been excluded, may be put on gluten-free diet. If he shows amelioration of symptoms, this regimen is continued. If, on the other hand, 3 months of gluten-free diet fails to benefit, the patient's record is reviewed to find, if he could be a case of tropical sprue. A Schilling test is indicated in this situation. If it is abnormal, he should be put on folic acid and/or tetracycline therapy. Symptomatic control of diarrhoea, as the diagnostic tests are in progress, is desirable.

Lastly, it is worthwhile to have a clear idea about the pattern of chronic diarrhoea/malabsorption in a particular region. This, together with an individualized approach and an adequate follow-up, solves a vast majority of the diagnostic problems.

Box 1 presents the protocol of 4 steps for evaluation of the child with chronic diarrhoea which is liable to modifications depending on the individual merits of a case.

Summary and Conclusion

Approach to paediatric chronic diarrhoea in the Indian subcontinent, with aetiological pattern at variance with that seen in the West, needs to be different. All children with chronic diarrhoea in whom history and clinical examination fail to point out a specific condition such as celiac disease, cystic fibrosis, inflammatory bowel disease, functional conditions, excessive consumption of beverages such as juices and soft drinks, short bowel syndrome, etc. should be first treated for malnutrition, iron-deficiency anaemia and worm infestations. Once response to treatment is unsatisfactory, they should be investigated for other disorders as per a protocol that may be modified according to the individual merits of the case.

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