



## Chronic Diarrhoea: Scenario in Indian Vis-à-Vis Western Children

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### Abstract

**Background:** Chronic diarrhoea, defined as diarrhoea of 2 weeks or more duration, is a common problem in Indian children. Until recently, this remained ambiguous if the approach to its diagnostic evaluation and management warranted to be the same as followed in the western countries.

**Objective:** To focus on the current etiologic profile of chronic diarrhoea in childhood in India and highlight the major differences between the profile encountered in Western children.

**Design:** The review is based on author's extensive experience in chronic diarrhoea in children in India spread over the past four decades and the information available in the English medical literature.

**Salient Features:** Aetiology of chronic diarrhoea in resource-limited settings is exhaustive. Nonetheless, only a few conditions such as protein-energy malnutrition (PEM), iron-deficiency anaemia (IDA), intestinal parasitosis (giardiasis, ancylostomiasis), and excessive consumption of soft drinks monopolise the situation. Coeliac disease, inflammatory bowel disease, and cystic fibrosis do occur but less frequently. This picture sharply contrasts with the pattern dominated by celiac disease, cystic fibrosis and inflammatory bowel disease in the Western children.

**Conclusion:** A good idea about the pattern of aetiology of chronic diarrhoea in different regions together with an individualised approach and an adequate follow-up is likely to resolve a large majority of the diagnostic problems in chronic diarrhoea in paediatric practice. Treatment depends on the aetiological condition. With the evolving socioeconomic and living conditions, futuristic changes in the aetiological pattern in India are expected in future. As the nutritional status improves and gut parasitic infestations get controlled, the pattern may slowly move towards the one that is seen in the western countries.

**Keywords:** Ancylostomiasis; Chronic Diarrhoea; Coeliac Disease; Cystic Fibrosis; Endemic Tropical Sprue; Giardiasis; Intestinal Parasitosis; Iron Deficiency Anaemia; Protein-Energy Malnutrition

### Introduction

Chronic diarrhoea in children is a common problem globally [1]. Its definition has changed at least thrice over the past half a century [2]. Currently, it is usually defined as "diarrhoea of 2 weeks or more duration" [2-6]. Invariably, it is accompanied by malabsorption. Untreated children suffer from increased frequency of steatorrheic stools with change in appetite (usually poor), growth

failure/failure to thrive, malnutrition involving various major and minor nutrients including vitamins, vulnerability to superadded infections, etc.

This communication proposes to highlight the salient features of the aetiology of paediatric chronic diarrhoea as seen in India and then compare it with that seen in the western world.

### Indian scenario: Yesterday and today

Around half a century back, widespread studies conducted at the Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India, found out that aetiology of chronic diarrhoea in children in north India was drastically at variance with that of the prosperous countries of the west [6,7]. In the subsequent decades, our and other researchers' observations not only from various parts of North India but also other regions of the country have stood the test of time [8,9], finding further support from different quarters in the Indian subcontinent [1,2,10].

Undoubtedly, aetiology of chronic diarrhoea is exhaustive. However, in clinical practice in resource-limited settings, only a few conditions such as protein-energy malnutrition (PEM), iron-deficiency anaemia (IDA), intestinal parasitosis (giardiasis, ancylostomiasis), cow's milk protein allergy (CMPA) and excessive consumption of soft drinks monopolise the situation.

The contribution of malnutrition in the form of protein-energy malnutrition (PEM) and iron-deficiency anaemia (IDA) is indeed huge in the etiology of chronic diarrhoea. Unfortunately, somehow these conditions continue to be rampant despite improving preventive and therapeutic measures. Yet, deserving recognition of their role in causation of chronic diarrhoea is lacking. Both PEM and IDA cause diarrhoea predominantly through damage to the small intestinal mucosa (villous atrophy), resulting in malabsorption [3]. Some of the children, usually preadolescent and adolescents presenting with diarrhoea in association with malnutrition have endemic tropical sprue. This somewhat vague entity is characterised by additional presence of significant anaemia with megaloblastic predominance. Response to appropriate antibiotic and folic acid therapy is gratifying. Its diagnosis is largely by exclusion and therapeutic outcome.

Next, a word about intestinal parasitic infestations. By and large, the state of affairs with regard to this condition is identical with malnutrition as a neglected cause of chronic diarrhoea in paediatric community. Infection with *L. giardia*, once considered a commensal, is a common cause of chronic diarrhoea both in urban and rural children [12,13]. Hookworm infestation (ancylostomiasis) is common in slum and rural children who move about bare-footed. It causes chronic/recurrent diarrhoea, often alternating with constipation, secondary to insult to the intestinal epithelium in the form of villous atrophy [3]. Additionally, a glaring feature of

these patient's symptomatology is slow development of moderate to severe anaemia with recurrent abdominal pain.

Excessive indulgence in soft drinks, including fruit juices, soda and colas is emerging as a significant contributor to chronic diarrhoea cases in paediatric practice [4]. As we have been repeatedly emphasising with increasing support from other experts [1], even overuse of oral rehydration salt/solution (ORS), which happens in some families, is responsible for chronic diarrhoea in quite a proportion of cases [1,2].

Coeliac disease is next in frequency. Until around 1970s, coeliac disease was generally believed to be more or less non-existent in Indian children. Thereafter, its existence has been documented from many parts of India, especially north India [11-13] where wheat is a staple diet. In the past couple of decades, with increasing use of wheat in even rest of the country (that is usually rice-eating), coeliac cases are being consistently identified. With enhancing awareness, more and more cases are likely to be diagnosed in the years to come. If malnutrition and intestinal parasitic infestations show a significant decline in the foreseeable future, coeliac disease may turn out to be a lead cause in India too [2]. Admittedly, for the time being, it is still far behind in the etiologic list at least in the low-income segments of the society. Similar observation has been made by Pipalya, *et al* [14].

Similarly, until 1970, cystic fibrosis was believed to be non-existent in India. The Chandigarh studies followed by studies from other parts of the country have proved its existence though the frequency is not high. Several reports of its existence are on record from India [15-20]. A high index of suspicion plays a significant role in its recognition. All cases of chronic diarrhoea with chronic/recurrent respiratory infections from early infancy should have a sweat chloride test for confirmation of this diagnosis.

Irritable bowel syndrome (IBS), a functional condition, is a frequent cause of chronic diarrhoea in school-age children and adolescents in India [1,2]. In addition to chronic/recurrent diarrhoea, these subjects suffer from abdominal discomfort/pain and constipation on top of chronic diarrhoea.

Cow milk protein allergy (CMPA) is being increasingly recognized in India [2]. Some of the infants with CMPA develop chronic diarrhoea. Other symptoms include, skin rash, recurrent vomiting,

loose motions, abdominal discomfort or pain, anaemia and me-laena.

Inflammatory bowel disease (Crohn disease, ulcerative colitis) and surgical short gut are infrequent causes of chronic diarrhoea in Indian children.

**Indian vis-à-vis western scenario**

Experience has convincingly demonstrated that aetiology of chronic diarrhoea in pediatric population is exhaustive worldwide. In our experience spread over four decades, in clinical practice in resource-limited settings, only a few conditions such as malnutrition (PEM, IDA), intestinal parasitosis (giardiasis, ancylostomiasis), CMPA, IBS, excessive consumption of soft drinks monopolize the situation. Coeliac disease is being increasingly diagnosed. However, at present, it is no match to aforesaid causes in the low-income populations. Cystic fibrosis occurs but less frequently. Inflammatory bowel disease is infrequent. This picture sharply contrasts with the pattern dominated by celiac disease, cystic fibrosis and inflammatory bowel disease in Western children.

India	Western countries
Malnutrition	Coeliac disease
Intestinal parasitosis	Inflammatory bowel disease
Irritable bowel syndrome	Irritable bowel syndrome
Overuse of soft drinks	Cystic fibrosis
Cow milk protein allergy	Overuse of soft drinks
Celiac disease	Cow milk protein allergy

**Table 1:** Five top causes of childhood chronic diarrhoea in India and West.

Diagnostic evaluation needs to be step-by-step with good history-taking and clinical examination followed by select investigations depending on the individual merits of the cases [21]. Mild to moderate steatorrhea is usually indicative of PEM, iron-deficiency anaemia or intestinal parasites (*L. giardia*, *A. duodenale*). Gross steatorrhea is usually due to coeliac disease or cystic fibrosis. In cystic fibrosis, steatorrhea is primarily of extraintestinal origin. Intestinal absorption is not affected until significant malnutrition develops.

Severe chronic diarrhoea, florid malabsorption (especially B<sub>12</sub> deficiency) and demonstrable villous atrophy on histology point to the diagnosis of tropical sprue. On the other hand, presence of

more upper abdominal symptoms indicates parasitic infestations. This point is of use in instituting empirical antiparasitic therapy in children with negative stool microscopy and normal small intestinal biopsy picture.

**Conclusion**

Etiology of chronic diarrhoea in Indian children is at variance with that of the western children. A good idea about its pattern in different regions together with an individualised approach and an adequate follow-up is likely to resolve a large majority of the diagnostic problems. Treatment depends on the aetiologic condition.

With the changing socioeconomic status and living conditions, futuristic changes in the aetiologic pattern in India are expected. As the nutritional status improves and gut infestations get significantly controlled, the pattern may slowly move towards the one that is seen in the western countries.

**Conflict of Interest**

Nil.

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