

## Clinical profile of children under 5 years presenting with acute diarrhea in coastal Karnataka.

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### Abstract

**Background and objectives:** Acute diarrhea is the 3<sup>rd</sup> leading cause of under-five mortality in India after pneumonia and prematurity. Acute diarrhea can be either infectious or noninfectious. There are a lot of risk factors associated with infectious diarrhea and also resulting complications majorly dehydration. Our aim was to study the clinical profile of under five children presenting with diarrhea.

**Materials and methods:** This was a descriptive observational study done in 120 children meeting the inclusion and exclusion criteria, who were admitted in the pediatric ward in a tertiary care hospital in south Karnataka. After obtaining an informed consent, a detailed clinical examination was performed on children meeting the inclusion criteria and the data was entered to the preformatted excel sheet.

**Results:** 120 children fulfilling criteria were recruited for the study. 41% of study subjects were less than 3 years. Male constituted for 62%. Malnourished children in the study group were 43%. Dehydration was seen in 28 children. 4 children presented with dysentery. There was significant association between malnutrition and dehydration.

**Conclusion:** Diarrhoea occurs at a high frequency in developing countries troubling the young age children. Majority of children were under 3 years of age. Commonly associated symptoms were vomiting, fever and pain abdomen. Dehydration being the most common complication of acute diarrhoea. Malnourishment is the major risk factor for children going in for dehydration.

**Keywords:** Diarrhea, Urine culture, Malnourishment, Dehydration.

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### Introduction

Diarrhoea is the passage of unusually loose or watery stools, usually at least three times in a 24 hour period. Frequent passing of formed stools is not diarrhoea. It is the consistency of the stools rather than the number that is most important. Acute diarrhea is common in infants and children and is the second most common bacterial infection. Diagnostic algorithms classify diarrhea as either infectious or non-infectious. Infectious diarrhea is caused by direct infection of the gastrointestinal tract by microorganisms. Very little consideration is usually given to diarrhea in patients with infectious diseases that do not primarily affect the gastrointestinal tract but are systemic or affect other organ systems [1]. Acute diarrhoea constitutes a leading cause of morbidity and mortality among children below 5 years of age in developing countries. More than 2 million deaths are estimated to result each year as a consequence of diarrheal disease in children below five years of age. Eighty percent of these deaths occur in the first two years of life, main causes being dehydration, complications associated with dysentery, malnutrition and serious infection such as pneumonia. Most of the diarrheal episodes occur during the first 2 years of life (highest incidence 6 to 11 months), low socioeconomic status, in non-breastfed infants, and in association with measles, severe malnutrition and immunodeficiency. Aim of the study

was to know the clinical profile of under 5 children presenting with acute diarrhea and associated factors [2].

### Materials and Methods

This descriptive hospital-based study was conducted in the department of pediatrics, in a tertiary care hospital in south Karnataka. In the study period 120 diarrhea cases admitted to the pediatric ward were included. Children who satisfied the inclusion criteria (children aged 6 months to 5 years admitted with diarrhea) with proper consent from parents or primary care givers were included in the study. Exclusion criteria included children with congenital anorectal malformations, any associated metabolic disorders and children who have received antibiotics 48 hours prior to the admission [3]. After obtaining an informed consent, a detailed clinical examination was performed and entered to the preformatted data sheet. Stool samples were obtained from all the patients. Assessment of hydration status was done according to WHO guidelines. Malnutrition grading was done based on IAP classification. All the data were recorded in a predesigned data collection form. The data was checked for completion, consistency and accuracy. Data was analyzed using SPSS software version 24.0.

## Results

A total of 120 children presenting with acute diarrhea were admitted to the pediatric ward were taken up for the study

(Table 1). Maximum number of cases in the study population were in the group 1 year to 3 years (41%) followed by the age group of 6 months to 1 year (36%) (Table 2).

Age	Frequency (n)	Percent (%)
6 Months-1 year	43	35.8
1 Year-3 year	49	40.8
3 Year-5 year	28	23.3
Total	120	100

**Table 1.** Age wise distribution of diarrhoea cases.

Gender	Frequency	Percent
Female	46	38
Male	74	62
Total	120	100

**Table 2.** Gender wise distribution of diarrhoea cases.

The above data shows that the majority of the study population were male children (62%) (Table 3). Out of 120 children in the study group, 46 (38%) children were found to have

malnutrition, out of which 40 (33%) had grade 1 PEM. Severe malnutrition was seen in two children (Table 4).

Anthropometry	Frequency (n)	Percent (%)
Normal	74	62
Grade 1	40	38
Grade 2	4	3
Grade 3	2	2
Total	120	100

**Table 3.** Anthropometry.

Dehydration	Frequency (n)	Percent (%)
No	92	77
Some	19	16
Severe	9	7
Total	120	100

**Table 4.** Dehydrational status.

In 120 study population, 23% children were dehydrated. Some dehydration was seen in 19 (16%) and 9 children were severely

dehydrated (Table 5). In the current study 23 (19%) children had poor bowel and bladder hygiene (Table 6).

Hygiene	Frequency (n)	Percent (%)
Good	97	81
Poor	23	19
Total	120	100

**Table 5.** Bowel and bladder hygiene.

Findings	Frequency (n)	Percent (%)
Normal	85	71
Hepatosplenomegaly	7	6
Diffuse tenderness	18	15
Suprapubic tenderness	10	8
Total	120	100

**Table 6.** Per abdomen examination findings.

Out of 120 children in our study 18 children had diffuse tenderness and 10 kids had suprapubic tenderness, where as 85 children had normal per abdominal findings (Table 7). In the conducted study 9% of stool routine showed pus cells. 4%

children had dysentery (Table 8). It was noted in our study that vomiting was the most common associated symptom seen in 49% of children (Table 9). We noted a statistically significant association between malnutrition and dehydration.

Stool routine	Percent (%)
Normal	87
Pus cells	9
Blood and mucus	4
Total	100

**Table 7.** Stool routine.

Symptom	Frequency (n)	Percent (%)
Vomiting	59	49
Fever	11	9
Pain abdomen	3	3
Vomiting , fever	26	21
Vomiting, pain abdomen	8	7
Fever, pain abdomen	2	2
Fever, vomiting, pain abdomen	11	9
Total	120	100

**Table 8.** Associated symptoms with diarrhoea.

Malnutrition vs. Dehydration	No PEM	Grade 1 PEM	Grade 2 PEM	Grade 3 PEM	Total
No dehydration	65	23	4	0	92
Some dehydration	5	13	0	1	19
Severe dehydration	4	4	0	1	9
Total	74	40	4	2	120

**Table 9.** Malnutrition vs. dehydration status.

## Discussion

The spectrum of illness extends from minor symptoms to life threatening systemic illness. Most of children admitted with diarrhoea were 1-3 years, accounting for 41% and another 36% were infants.

This was similar to study conducted by Haricharan, et al., where 87% of children were below 2 years of age [4].

The associated symptom documented with diarrhoea was vomiting, fever, pain abdomen. Among these vomiting was the most common associated symptom seen among 81% of children followed by fever in 41%, pain abdomen in 20% of children. And all three associated symptoms were seen in 9% of study population. Elzanki, et al. also noted in their study that vomiting was commonly associated with diarrhoea. In the present study population, 46% children had malnutrition, indicating that malnutrition predisposing for episodes of diarrhoea. The interaction between malnutrition and diarrheal diseases, as for most infections, is bidirectional. The nutritional state alters the host response to infection and infectious illness alters nutritional state. And the proposed theory for diarrhea in malnutrition was low levels of secretory levels of IgA at the mucosal surfaces or a subclinical vitamin A deficiency present in the malnourished children. Malnourished children were more likely to experience multiple episodes of diarrhea, even though no difference in the duration of diarrhea was noted [5]. Dehydration is the most common complication seen in acute diarrhea. In our study 28 children out of 120 study subjects were found to have dehydration. Severe dehydration was seen in 7% of the study subjects. This statistic was almost similar to other studies where dehydration in acute diarrhoea ranged from 5%-10%. Our study positively correlated between the degree of malnutrition with the degree of dehydration [6]. ( $p < 0.001$ ) that is children with higher grades of malnutrition had higher degrees of dehydration and vice versa. Study by Skrablek, et al. concluded that children with malnutrition are at greater risk of severe morbidity and mortality from diarrheal disease and it is important to ensure that diagnostic tools used to assess the degree of dehydration in children are also accurate in these populations. Dysentery was seen in 4 children. All 4 children were malnourished [7]. Out of which 2 children had dehydration. These children presented with fever as an associated symptom which is more common as reported by Khalili, et al. There were no mortality in the study group. The limitations of the study were, stool culture was and organism isolation was not done because of financial constraints hence could not comment on the etiology of the episodes [8]. All children were managed in the wards, using WHO protocol and only children with dysentery received antibiotics accordingly [9]. Thus, there was significant association between diarrhoea and age, nutritional status, dehydration in the present study. Since diarrhea is one of the common health issue in less than 5 years old and also contribute to complications like dehydration and malnutrition, it is desirable to treat at the earliest and to convey health education to care givers about the social factors associated with diarrhea, so as to prevent the recurrent episodes [10].

## Conclusion

Most of children in our study admitted with diarrhoea were 1-3 years, accounting for 41%. The associated symptom with diarrhoea were vomiting, fever, pain abdomen.

Among these vomiting was the most common. 46% children had malnutrition, indicating that malnutrition predisposing for episodes of diarrhoea. Dehydration is the most common complication seen in acute diarrhea and correlated between the degree of malnutrition with the degree of dehydration indicating children with higher grades of malnutrition had higher degrees of dehydration.

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