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Original Research Article

Clinical Profile of Under-Five Children Admitted with Acute Diarrhea in a Pediatric Ward: A Hospital-Based Study

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Abstract:

Background: Acute diarrhea remains a leading cause of morbidity and mortality among under-five children, particularly in developing countries, with dehydration and malnutrition as major contributors to adverse outcomes.

Aim: To assess the clinical profile and associated factors among under-five children admitted with acute diarrhea in a pediatric ward.

Methodology: This descriptive hospital-based study was conducted over six months at Department of Pediatrics, Government Medical College and Hospital, Bettiah, Bihar, India, including 80 children aged 6 months to 5 years. Data on demographics, clinical features, dehydration status (WHO), nutritional status (IAP), and stool findings were collected and analyzed using descriptive statistics.

Results: Most children were aged 1–3 years (40%) with male predominance (62.5%). Majority had no dehydration (75%), while 7.5% had severe dehydration. Vomiting was the most common symptom (45%). Nutritionally, 60% were normal, though 40% had varying grades of malnutrition. Stool findings were normal in 85% cases. Increased severity of dehydration was associated with higher grades of malnutrition.

Conclusion: Acute diarrhea in under-five children is commonly mild, but malnutrition increases vulnerability to severe dehydration. Early assessment and nutritional support are essential for better outcomes.

Keywords: Acute Diarrhea, Under-Five Children, Dehydration, Malnutrition, Clinical Profile, Pediatric Ward.

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Introduction

Diarrhea is the flow of exceptionally loose or watery faeces and is typically at least three times within a 24-hour timeframe. Several stools that have been formed are not diarrhea; consistency of the stools is what matters most when examining the patient. Acute diarrhea is an illness that is prevalent in infants and young children and is one of the most prevalent causes of morbidity in the pediatric population world over [1]. It is believed to be the second prevalent infection in this category of bacteria. Diagnostic algorithms provide general categories of diarrhea; infectious and non-infectious. Infectious diarrhea is caused by direct infection of the gastrointestinal tract by microorganisms, i.e. bacteria, viruses and parasites. Nonetheless, less emphasis is usually put on the diarrhoea that happens to accompany systemic infections which are not necessarily gastrointestinal tract infections but will still manifest diarrhoeal symptoms [2].

The acute diarrhoeal diseases continue to be a significant health issue of the population, especially in developing nations such as India. They form one of the most common causes of morbidity and mortality in children below the age of five years. In this age group, diarrhoeal diseases are known to claim over 2 million lives every year around the globe. A large percentage of such deaths, about 80 per cent, are in the first two years of life [3]. The high mortality related to acute diarrhoea has much to deal with preventable and curable conditions like dehydration as well as complications related to dysentery, malnutrition, and other severe infections such as pneumonia. Although there has been an improvement in healthcare, diarrhoeal diseases have been disproportionately high in low- and middle-income countries because of poor sanitation, insecure drinking water and insufficiency of hygiene practices and insufficient access to healthcare facilities [4].

Epidemiology of acute diarrhoea shows that most of the cases are found within the ages of the first two years with the peak cases recorded between 6 to 11 months of age. This is the time when there is introduction of complementary feeding, greater exposure to contaminated food and water and decrease in maternal antibodies. It has been established that there are several risk factors which increase the susceptibility and severity of diarrhoeal diseases in children. These are low socioeconomic conditions, non-exclusive breastfeeding, poor nutritional conditions, and underlying diseases like measles and immunodeficiency. Children with malnutrition are especially susceptible to such conditions, because diarrhoea does not only worsen nutritional deficiencies, but also undermines immune defenses, which leads to the vicious cycle of the disease and malnourishment [5].

The prevalence of diarrhoeal diseases remains as a major problem to the health of children in the Indian setting and particularly in rural and semi-urban regions. The state of Bihar is one of the most socioeconomically disadvantaged but populated states in India, with a high rate of childhood illnesses such as acute diarrhoea. Bettiah, the West Champaran district of Bihar can be taken as an example of the area where access to healthcare, the infrastructure of sanitation facilities, and the awareness of preventative measures may be poor. The environmental, socioeconomic and healthcare-related factors of the region are combined to cause the high frequency and intensity of diarrhoeal diseases in children. Such hospital-based studies are essential in clinical presentation, severity patterns and other risk factors of acute diarrhoea in children [6].

Knowledge of the clinical picture of under-five patients with acute diarrhoea helps to enhance the management of cases and improve morbidity and mortality. Clinical profiling involves examination of the symptoms of presentation like stool frequency and consistency, vomiting, fever, dehydration, and complications. It is also associated with assessment of nutritional status, feeding habits, immunization history and socioeconomic background [7]. This type of information may assist in determining high-risk groups and providing the relevant interventions such as rehydration therapy, nutritional support, and treating underlying infections.

More so, prompt identification and proper categorization of dehydration i.e. no dehydration to severe dehydration is important elements of diarrhoea treatment. Early and successful remedy by means of oral rehydration solution (ORS), supply of zinc, and ongoing feeding is demonstrated to effectually decrease the trauma and the length of the diarrhoea episodes [8]. Nevertheless, underspending on the promptness of medical attention, ignorance, and poor treatment habits are still impediments in most of the rural India including Bettiah.

The research that is developed within hospitals is useful in terms of comprehending the burden and the clinical features of diarrhoeal diseases in the case of the hospitalized inmates as they usually are some of the more severe manifestations of the disease. The studies are also useful in determining trends associated with seasonal variation, etiological factors and complications. Moreover, they help in the review of the existing treatment practices and identify the shortcomings in the healthcare delivery systems.

The current research was conducted within a pediatric ward, Bettiah, Bihar, where the aim of the research was to determine the clinical profile of under-five children admitted with acute diarrhoea and reveal related factors. The study aims to add to the increased knowledge on the burden of disease in the region by assessing the demographic attributes, medical signs, and risk factors of the disease. The results can be used to develop specific prevention, early diagnosis and effective management of acute diarrhoea in young children and minimize the morbidity and mortality rates of the vulnerable population.

Methodology

Study Design: This study was a descriptive, hospital-based observational study conducted to evaluate the clinical profile of under-five children admitted with acute diarrhea. The design was chosen to systematically record and analyze clinical and demographic characteristics of affected children without any intervention beyond standard care.

Study Area: The study was conducted in the Department of Pediatrics, Government Medical College and Hospital, Bettiah, Bihar, India.

Study Duration: The study was carried out over a period of six months from March 2025 to August 2025.

Sample Size: A total of 80 children fulfilling the inclusion criteria were enrolled in the study. The sample size comprised all consecutive cases admitted with acute diarrhea during the study period until the required number was achieved.

Study Population: The study population included children aged between 6 months and 5 years who were admitted to the pediatric ward with a clinical diagnosis of acute diarrhea. These children represented a spectrum of cases presenting to the hospital during the study period.

Data Collection: Data were collected after obtaining informed consent from the parents or primary caregivers using a pre-designed and pre-tested data collection form. Detailed information regarding demographic profile, clinical presentation, duration and frequency of diarrhea, associated symptoms such as vomiting and fever, feeding practices, and immunization status was recorded. A thorough

clinical examination was performed for each child. Hydration status was assessed according to World Health Organization (WHO) guidelines, and nutritional status was evaluated using the Indian Academy of Pediatrics (IAP) classification. Stool samples were collected and analyzed wherever indicated. All collected data were carefully recorded and checked for completeness and accuracy.

Inclusion Criteria

- Children aged 6 months to 5 years
- Admitted with acute diarrhea (duration <14 days)
- Children whose parents/guardians provided informed consent

Exclusion Criteria

- Children with chronic diarrhea (>14 days)
- Children with congenital gastrointestinal anomalies (e.g., anorectal malformations)
- Children with associated metabolic disorders
- Children who had received antibiotics within 48 hours prior to admission

Study Procedure: All eligible children admitted during the study period were enrolled consecutively until the desired sample size was reached. Each patient underwent detailed history taking and clinical examination, followed by assessment of dehydration status and nutritional grading. Relevant laboratory investigations were carried out where necessary. The management of all patients was done according to standard treatment protocols recommended by WHO and hospital guidelines.

Statistical Analysis: The collected data were entered into Microsoft Excel and subsequently analyzed using SPSS software version 24.0. Descriptive statistics such as mean and standard deviation were used for continuous variables, while categorical variables were expressed as frequencies and percentages. The results were presented using tables and charts. Where applicable, statistical tests such as the Chi-square test were used to determine associations between variables, and a p-value of less than 0.05 was considered statistically significant."

Result

Table 1 presents the socio-demographic profile of 80 patients. The majority of children were in the 1–3 years age group (32, 40%), followed by 6 months–1 year (28, 35%) and 3–5 years (20, 25%). There was a male predominance, with 50 males (62.5%) compared to 30 females (37.5%). This indicates that most cases occurred in younger children, particularly toddlers, with a higher representation of males in the study population.

Table 1: Socio-demographic profile of study population (N = 80)

Variable	Category	Frequency (n)	Percent (%)
Age	6 Months–1 year	28	35
	1–3 years	32	40
	3–5 years	20	25
Gender	Male	50	62.5
	Female	30	37.5

Table 2 presents the clinical profile and examination findings of 80 patients. Most patients had no dehydration (60, 75%), while 14 (17.5%) had some dehydration and 6 (7.5%) had severe dehydration. On abdominal examination, 56 patients (70%) had normal findings, whereas diffuse tenderness was noted in 12 (15%), suprapubic tenderness in 7 (8.75%), and hepatosplenomegaly in 5 (6.25%). Regarding bowel and bladder hygiene, the majority maintained good hygiene (62, 77.5%), while 18 patients (22.5%) had poor hygiene. Overall, most patients had mild clinical findings with a smaller proportion showing significant abnormalities.

Table 2: Clinical profile and examination findings (N = 80)

Variable	Category	Frequency (n)	Percent (%)
Dehydration status	No dehydration	60	75
	Some dehydration	14	17.5
	Severe dehydration	6	7.5
Per abdomen findings	Normal	56	70
	Hepatosplenomegaly	5	6.25
	Diffuse tenderness	12	15
	Suprapubic tenderness	7	8.75
Bowel & bladder hygiene	Good	62	77.5
	Poor	18	22.5

Table 3 presents the nutritional status and stool findings among 80 patients. According to IAP classification, the majority were nutritionally normal (48, 60%), followed by Grade I PEM (24, 30%),

while Grade II (6, 7.5%) and Grade III (2, 2.5%) malnutrition were less common. Stool examination showed that most patients had normal findings (85%), while 10% had pus cells and 5% showed blood and mucus. Overall, although most children were nutritionally normal, a considerable proportion had mild to moderate malnutrition, and abnormal stool findings were present in a minority of cases.

Table 3: Nutritional status and stool findings (N = 80)

Variable	Category	Frequency (n)	Percent (%)
Nutritional status (IAP)	Normal	48	60
	Grade I PEM	24	30
	Grade II PEM	6	7.5
	Grade III PEM	2	2.5
Stool routine	Normal	—	85
	Pus cells	—	10
	Blood & mucus	—	5

Table 4 presents the associated symptoms in 80 patients with diarrhoea. Vomiting alone was the most common symptom, seen in 36 patients (45%), followed by combined vomiting and fever in 16 (20%). Fever alone and the combination of vomiting, fever, and abdominal pain were each observed in 8 patients (10% each). Vomiting with abdominal pain was present in 6 patients (7.5%), while abdominal pain alone occurred in 4 (5%). The least common combination was fever with abdominal pain, seen in only 2 patients (2.5%). Overall, vomiting—either alone or in combination—was the predominant associated symptom.

Table 4: Associated symptoms with diarrhoea (N = 80)

Symptom	Frequency (n)	Percent (%)
Vomiting	36	45
Fever	8	10
Pain abdomen	4	5
Vomiting + Fever	16	20
Vomiting + Pain abdomen	6	7.5
Fever + Pain abdomen	2	2.5
Vomiting + Fever + Pain abdomen	8	10
Total	**80**	**100**

Table 5 shows the relationship between malnutrition (PEM grades) and dehydration status among 80 patients. Among those with no dehydration (60 patients), the majority were nutritionally normal (40), followed by Grade I PEM (16), with very few in Grade II (3) and Grade III (1). In patients with some dehydration (14), cases were more evenly distributed, with 6 normal, 6 Grade I, and 1 each in Grade II and III. Among those with severe dehydration (6), malnutrition was more prominent, with 2 patients each in normal, Grade I, and Grade II PEM, and none in Grade III. Overall, normal nutritional status was most common (48), but higher grades of malnutrition appeared relatively more frequent in patients with increasing severity of dehydration.

Table 5. Malnutrition vs Dehydration status (N = 80)

Malnutrition vs Dehydration	Normal	Grade I PEM	Grade II PEM	Grade III PEM	Total
No dehydration	40	16	3	1	60
Some dehydration	6	6	1	1	14
Severe dehydration	2	2	2	0	6
Total	**48**	**24**	**6**	**2**	**80**

Discussion

The current study indicates that most of the children admitted to acute diarrhea were between the age of 1-3 years (40%), then came infants aged 6 months-1 year (35%). This age group agrees with other research in which the younger kids, especially young children under the age of 2 years, were observed to be more prone to diarrheal diseases because of inadequate immunity, and exposure to contaminated food and environment. As an example, Gupta et al. (2015) [9] have also found that almost 87 percent of the incidences of diarrhea were among children under the age of 2 years, which is closely related to our results, which revealed that the burden was more in early childhood. The relative higher percentage in the 13-year age group in our study could have been attributed to the fact that at their age group they are

more prone to infections due to the high level of mobility and exposure to the environment."

Male children were more often brought to receive medical care, and this is the reason why our study demonstrated a male preponderance (62.5%). Even though the differences in terms of biological susceptibility have not been figured yet, this pattern can be partially attributed to the sociocultural aspects that affect healthcare-seeking behavior in most areas, including India. Other previous works have reported similar gender distributions, indicating that male children seemed more prone to hospitalization due to diarrheal diseases (Farthing et al., 2013) [10].

Clinically, vomiting was found to be the highest related symptom in our study (45%), with mixed symptoms comprising of vomiting and fever (20%). The given result is consistent with previous research, but the vomiting frequency we have is lower than the stated 81% of Elzanki et al., (1985) [11] which means that it can be varied dependent on the study environment and the population. Our cohort had fewer cases of fever and abdominal pain either singly or combined. Vomiting is also identified in the past literature as one of the most significant symptoms of acute diarrhea, regularly leading to the loss of fluids and further dehydration (Radlovic et al., 2015) [12] The relative low rate of fever (10%) in our study compared to 41 percent in previous studies suggests a relatively high rate of non-invasive or viral causes in our population.

One of the serious complications of acute diarrhea, dehydration, was also found in 25% of children in our study and severe dehydration occurred in 7.5% of the cases. This compares to the previous reports whose dehydration rates were between 5 to 10 percent among hospitalized children (Aranda-Michel & Giannella, 1999) [13]. Nevertheless, one of the significant results of our research is that a significant percentage (75) of children showed no signs of dehydration, which could be explained by early access to healthcare or the good knowledge of the caregivers or the timely administration of oral rehydration solutions. It is just a little different to previous research in which more frequent cases of dehydration were reported, which could be explained by the delay or insufficient awareness.

During the nutritional examination conducted in our research, it was found that 40 percent of children were partially malnourished in protein-energy malnutrition (PEM), with the largest proportion of Grade I PEM (30 percent). This can be compared to previous results in which about 46 percent of children with diarrhea were malnourished. The two-way interaction between diarrhea and malnutrition has been properly determined. Malnutrition impairs immunity, especially mucosal immunity, including secretory IgA, which exposes one to infection, and recurrent cases of diarrhea worsen nutritional conditions (Pfeiffer et al., 2012) [14]. This relationship is also indicated in our findings because different levels of malnutrition were recorded in all the categories of dehydration.

In a comparative study of malnutrition and dehydration in our investigation, it can be observed that most of the children that were not dehydrated were normal in their nutrition (40/60), but malnutrition was observed even in this group. Moreover, children with severe dehydration had gender equality in both of the normal and malnourished groups, indicating that malnutrition makes the children more susceptible, but even without nutrition, dehydration can also develop. Nevertheless, earlier research have shown that there is a stronger degree of correlation between high grades of malnutrition and the severity of dehydration (Aranda-Michel and Giannella, 1999) [13]. Other potential reasons why the association may be relatively weak in our study are the smaller sample size or premature intervention in the clinic.

Most children in our study (70 percent) had normal results on abdominal examinations and less frequent were diffuse tenderness and other abnormalities. This is consistent with the overall clinical impression that the majority of acute cases of diarrhea, and particularly viral, do not contain any substantial abdominal symptoms (Thielman and Guerrant, 2004) [15]. Also, stool analysis was normal in eighty-five percent of the cases with a few percentages indicating the presence of the pus cells or blood and mucus, which further reinforced the possibility of non-invasive etiologies. Past investigations have also demonstrated that invasive bacterial diarrhea contributes a lower percentage of clinical cases in the pediatric groups than viruses (Farthing et al., 2013) [10].

Hygiene practices are also very vital in the incidence of diarrheal diseases. The overall good bowel and bladder hygiene in our study (77.5 percent) was also a possible factor in the comparatively lower cases of severe dehydration and complications. The lack of hygiene is another known cause of frequent diarrheal episodes as previously promoted in previous literature stating the significance of sanitation and education of the care givers (Binder, 1990) [16].

Altogether, our results are mostly conciliated with the existing literature, especially on the level of age distribution, the profile of symptoms, and the malnutrition factor. But the variations in the incidence of dehydration and related symptoms indicate the role of local conditions including access to healthcare, nutritional condition and the effect of health interventions by the population. These findings strengthen the importance of the early diagnosis, proper treatment to be applied with WHO guidelines, and preventive measures based on nutrition, hygiene, and caregiver education to minimize the incidence of acute diarrhea among under-five children.

Conclusion

The current hospital-based research indicates that acute diarrhea among children who are below the age of five years is mainly observed in young age groups with higher percentage of male patients. The majority of children did not have dehydration, and abdominal examination was generally not significant, but some of them exhibited tenderness or organomegaly. Most of them had good bowel and bladder cleanliness and most of the children were in a normal nutritional condition with mild malnutrition in a minor percentage. The findings of stool were mostly non-specific, and few of them exhibited infective characteristics. Vomiting emerged as the most common associated symptom, either alone or in combination with fever and abdominal pain. Additionally, the findings suggest a relationship between malnutrition and the severity of dehydration, indicating that children with poorer nutritional status may be more vulnerable to complications. Overall, the study highlights that while most cases are mild and manageable, attention to nutritional status and associated symptoms is important in the clinical assessment and management of pediatric diarrhea.

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