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CLINICO-EPIDEMIOLOGICAL PROFILE OF ACUTE DIARRHEA IN UNDER-FIVE CHILDREN ADMITTED TO A TERTIARY CARE CENTRE IN JAIPUR, RAJASTHAN

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Abstract
Acute diarrhea remains a major cause of morbidity and mortality among children under five years globally, particularly in developing countries. This study investigates the clinico-epidemiological profile of acute diarrhea in under-five children admitted to Mahatma Gandhi Medical College & Hospital, Jaipur. A total of 150 cases were included between March 2023 and February 2025. Socio-demographic variables, clinical features, risk factors, and outcomes were assessed. Results demonstrated higher incidence among infants, male predominance, significant association with lower socioeconomic status, and poor maternal literacy. Dehydration was the most common clinical feature, with exclusive breastfeeding showing a protective effect. The study emphasizes the importance of health education, improved sanitation, maternal literacy, and preventive interventions like rotavirus vaccination to reduce diarrhea-related morbidity and mortality.

Keywords: Acute diarrhea, under-five children, epidemiology, dehydration, maternal literacy, socioeconomic status, rotavirus

Introduction

Diarrhea is defined by the World Health Organization as the passage of three or more loose or liquid stools per day or more frequently than is normal for an individual. Among children aged 1 to 59 months, diarrheal illness is one of the leading causes of mortality and morbidity. Despite being preventable and treatable, diarrheal diseases account for approximately 1.7 billion episodes annually and nearly half a million deaths in children under five worldwide.[1] In India, diarrhea remains a major public health challenge due to inadequate sanitation, poor water quality, malnutrition, and socio-economic disparities.[2]

According to the United Nations International Children's Emergency Fund's (UNICEF) most recent report, malnutrition accounts for 45% of mortality among children under five, followed by pneumonia (15%), diarrhea (8%), malaria (5%), and other causes (9%).[3] Additionally, diarrheal illness is the leading cause of malnutrition, which ranks as the third leading cause of death for children under five, particularly in underdeveloped nations. [4] NFHS 4 reported the factors associated with diarrhea as inadequate sanitation, unsafe drinking water, low socioeconomic status, malnutrition, poor maternal literacy etc. [5] The mother's education, lower socioeconomic position, breastfeeding, site of residence,

family size, number of children under five in the household, mother's age, and mother's job status are some of the risk factors for diarrhea in children under five that have been discovered by previous research. [6–13]

The National Family Health Survey (NFHS-5) reported a prevalence of diarrhea of 7.3% among Indian children under five, with higher rates in rural areas compared to urban settings. States such as Bihar, Delhi, and Odisha have significantly higher prevalence rates compared to Goa or Lakshadweep. Risk factors include malnutrition, unsafe drinking water, low maternal education, large family size, and poor hygiene practices. Rotavirus, Shigella, and Cryptosporidium remain the leading pathogens associated with fatal diarrhea.[2]

This study aims to evaluate the clinico-epidemiological profile of acute diarrhea among children under five years admitted to a tertiary care center in Jaipur, Rajasthan, and to identify associated socio-demographic and clinical factors.

Materials and Methods

Study Design and Setting:

A hospital-based cross-sectional observational study was conducted at Mahatma Gandhi Medical College & Hospital, Jaipur, from March 2023 to February 2025.

Sample Size and Selection:

A total of 150 children under the age of five admitted with acute diarrhea were included using purposive sampling. Inclusion criteria were children <5 years with ≥3 loose stools/day requiring hospitalization. Exclusion criteria included children >5 years, those admitted to NICU/PICU, or lack of parental consent.

Data Collection:

A structured proforma was used to collect socio-demographic details, maternal literacy, socioeconomic status (assessed using B.G. Prasad scale), clinical history, risk factors, feeding practices, immunization status, and treatment history. Clinical examination focused on dehydration status, nutritional assessment, and systemic findings. Laboratory investigations included serum urea, creatinine, and electrolytes where necessary.

Ethical Considerations:

Ethical approval was obtained from the Institutional Ethics Committee. Informed consent was taken from parents/guardians.

Statistical Analysis:

Data were analyzed using SPSS v16. Descriptive statistics were applied. Associations between socio-demographic variables and diarrhea were analyzed, with $p < 0.05$ considered statistically significant.

Results

Table 1: Basic characteristics of patients:

Characteristics		**n = 150**	**In %**
Gender	**Male**	78	52%
	Female	72	48%
Age Group	**<1 year**	69	46%
	1–2 years	48	32%
	2–5 years	33	22%
Clinical Feature	**Watery diarrhea**	150	100%
	Vomiting	93	62%
	Fever	87	58%
	Abdominal pain	36	24%

	Blood/Mucus in stool	21	14%
Dehydration Level	**No dehydration**	48	32%
	Some dehydration	60	40%
	Severe dehydration	42	28%
Socio-economic Status	**I**	5	3.33%
	II	11	7.33%
	III	26	17.33%
	IV	50	33.33%
	V	58	38.67%

Table 2: Treatment Modalities and Outcomes

Treatment/Outcome	**Frequency**	**Percentage**
ORS + Zinc	150	100%
IV Fluids	42	28%
Antibiotics (dysentery)	21	14%
Avg. hospital stay (days)	3.5	-
Mortality	0	0%

- Maternal education: 38% illiterate, 22% primary, 28% secondary, 12% higher.

Feeding and Immunization Practices:
- Exclusive breastfeeding: 42%
- Mixed/bottle feeding: 58%
- Complete rotavirus vaccination: 21%

Risk Factors:
- Unsafe water: 64%
- Poor sanitation: 70%
- Overcrowding: 55%
- Poor handwashing practices: 61%

Discussion

This study highlights that acute diarrhea continues to be a major public health burden among under-five children in India. the distribution according to gender showed that males constituted 52% (78 children), and females constituted 48% (72 children), resulting in a male to female ratio of 1.08:1. The male predominance observed is consistent with findings from other Indian studies. A study by Sharma J et al (2021)[14] in Northern India reported that males were more affected than females (63.12% males vs 37.88% females), an observation they noted was in concordance with Jarman et al.[15] (56.2% and 43.8%, respectively). Similarly, Tejaswini Vishnu Sangrulkar et al (2018)[16] in Western Maharashtra found that males (54.76%) were more numerous than females (45.24%) among hospitalized under-five children with diarrhea. Majority of the participants were in the < 1 year of age (46%) and 1-2 years age group (32%). The study found that severe dehydration was significantly more prevalent among children in the lower age group (< 2 years), For instance, Bajaj et al. (2022)[17] reported the highest burden of diarrhea and hospital stay among children aged 1-12 months and under 2 years. Similarly, Nyati et al. (2019)[18] found that the age group most affected by rotavirus diarrhea, a common cause of acute diarrhea, was less than one year (59.5%), followed by 12-24 months (33%). Sangrulkar et al. (2018)[16] also noted infants (<1 year) as the largest group (28.57%) among hospitalized cases, with the 4–5-year group also being substantial (23.81%)**.** possibly reflecting gender-based healthcare-seeking behavior. Infants were the most affected, aligning with global evidence that immature immunity, early weaning, and unsafe feeding practices contribute to

vulnerability. In this study, a significant proportion of patients belonged to lower socioeconomic strata, with 42% in Class IV and 30.0% in Class V (as per the updated BG Prasad Scale). The study found that severe dehydration was significantly more prevalent in lower socioeconomic classes ($p<0.05$). For instance, 43.1% of those in SES Class V experienced severe dehydration. This aligns with the observation by Bajaj et al. (2022)[17] who noted that most parents in their study group belonged to a low socioeconomic group, emphasizing the importance of factors like education, sanitation, and nutrition which are often linked to socioeconomic status. However, it's worth noting that Mitkari et al. (2019)[19], in their study, found that socioeconomic status was not significantly associated with the frequency of diarrheal spells in under-five children. This suggests that while children from lower socioeconomic strata may represent a larger proportion of hospitalized cases in some settings, the direct link between socioeconomic status and the frequency of diarrhea episodes might not be consistent across all populations or study designs. A study conducted in Miraj also reported a high proportion of patients from lower socioeconomic strata according to the modified B.G. Prasad's classification, with 36.91% in Class IV and 33.93% in Class V.[16] The study on Cryptosporidiosis noted that children belonging to a low socio-economic class are likely to carry this infection. In contrast, a study in Mumbai (Shubhada Avchat et al.) found diarrhea to be more prevalent in the upper class of socioeconomic status, and this association was statistically significant[20].

Socioeconomic disparities played a central role, with the majority of cases belonging to lower socioeconomic classes. Maternal literacy emerged as a significant determinant, reinforcing the evidence that educated mothers are more likely to adopt hygienic practices, recognize early symptoms, and seek timely care. Exclusive breastfeeding was protective, while bottle feeding was a notable risk factor, supporting WHO recommendations for exclusive breastfeeding in the first six months. Clinical presentation was dominated by dehydration, confirming it as the most critical complication of diarrheal illness. Timely administration of ORS and zinc proved effective in reducing complications, consistent with WHO and UNICEF guidelines. The low uptake of rotavirus vaccination highlights gaps in immunization coverage, despite strong evidence of its efficacy in preventing severe diarrhea.

Comparison with other studies shows similar prevalence of dehydration and association with poor hygiene and socioeconomic factors. However, the absence of mortality in this study reflects improved hospital management and awareness compared to past decades.

Public Health Implications:

- Strengthening maternal education and awareness programs.
- Improving sanitation and access to safe drinking water.
- Promoting exclusive breastfeeding and discouraging bottle feeding.
- Enhancing rotavirus vaccine coverage.
- Reinforcing the use of ORS and zinc at the community level.

Conclusion

Acute diarrhea in under-five children remains strongly associated with low socioeconomic status, poor maternal literacy, and inadequate sanitation. Dehydration was the most common clinical manifestation, preventable with timely ORS and zinc therapy. Exclusive breastfeeding and rotavirus vaccination significantly reduce the risk. The study underscores the need for integrated preventive strategies focusing on maternal education, hygiene promotion, immunization, and community-based interventions to combat diarrheal morbidity and mortality.

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