

## A Cross-Sectional Assessment of the Clinico-Demographic Profile of Diarrheal Patients of Pediatric Age

**Mohammad Asghar Ali<sup>1</sup>, Anjum Equebal<sup>2</sup>, N. P. Gupta<sup>3</sup>**

**<sup>1</sup>Senior Resident, Department of Pediatrics, Darbhanga Medical College & Hospital, Darbhanga, Bihar, India**

**<sup>2</sup>Senior Resident, Department of Paediatrics, Darbhanga Medical College & Hospital, Darbhanga, Bihar, India**

**<sup>3</sup>Associate Professor, Department of Paediatrics, Darbhanga Medical College & Hospital, Darbhanga, Bihar, India**

**Received: 02-01-2023 / Revised: 25-01-2023 / Accepted: 04-02-2023**

**Corresponding author: Dr. Anjum Equebal**

**Conflict of interest: Nil**

### **Abstract**

**Aim:** To focus on the clinical and socio-demographic profile of infants and children presenting with acute diarrhea.

**Methodology:** This cross-sectional study was conducted in the Department of Pediatrics, DMCH, Darbhanga, Bihar for a period of 1 year (January – December 2022). House-to-house survey was done and data was collected by interviewing the mothers of selected children from 6 months to five years. The children were selected by a systematic random sampling technique. A total of 300 children under five were examined. Various parameters analyzed were age and gender distribution, chief complaints, feeding practices, nutritional status and estimation of dehydration. The data was accumulated and entered in a worksheet computer program. For all tests, confidence level and level of significance were set at 95% and 5% correspondingly.

**Results:** The mean age of patients was  $2.62 \pm 1.56$  years. 52 were toddlers in this group. The remaining were infants and pre-school children. Out of 300 patients 156 (52%) males exceeded 144 (48%) females. Similarly in the case of Exclusive breast-feeding: Exclusive breastfeeding (EBF) for 6 months was given in a large no. of patients i.e. 150 (50%). 24% were given for 5 months, 16% were given for 4 months, and 10% were given for 7 months. A majority of patients (156, 52%) were not given bottle feeding while the remaining (144, 48%) were given. Maximum patients (126, 42%) had no dehydration whereas remaining 36% patients had some dehydration and 22% had severe dehydration.

**Conclusion:** Less than half of the children under research had some-dehydration. Dehydration and malnutrition can also be prevented through patient education, availability of safe drinking water, adequate sanitation and hygiene.

**Keywords:** Dehydration, Malnutrition, Diarrhoea.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

### **Introduction**

The world health organization (WHO) defines diarrhea as the passage of three or

more loose or liquid stools per day in a period not exceeding 14 days [1]. Diarrhea

is commonly a sign of an infection in the intestinal tract that is caused by different bacteria, virus and parasitic entities [1]. In low resource areas, Rotavirus and Escherichia coli bacteria cause the highest incidents of diarrhea [2]. These microorganisms spread throughout unclean water and contaminated food or from one person to another, and are most widespread in settings with poor hygiene and absence of access to clean drinking water and sanitation [2]. Diarrhea continues to be one of the leading causes of child mortality, mostly in children less than 5 years of age living in low and middle-income countries [3].

Nonetheless, diarrhea-linked mortality is lessening worldwide by 4 % annually; though, the decline in occurrence is diffident. It is measured that annual diarrhea accounts for about 2.5 billion cases in children less than 5 years old, affecting up to 60 % of travelers to some low-income areas [4,5]. WHO has estimated that globally there are nearly 1.7 billion cases of childhood diarrheal disease every year and that it remains the 2<sup>nd</sup> leading cause of death in children under 5 years worldwide [6].

Diarrhea is more prevalent in low and middle-income settings as a result of the absence of safe drinking water, sanitation and hygiene, and mostly a worse health and nutritional status. An estimated 2.5 billion individuals need enhanced sanitation facilities, and almost one billion people lack access to safe drinking water. These unhygienic settings allow diarrhea-causing pathogens to multiply and spread more quickly [7]. Rural access to safe drinking water sources is decreasing, and individuals using an improved source still need to travel for long distances to get water [8]. Mother's literacy, family income, feeding practices and environmental conditions are the important determinants of growth and health status of children under five. Diarrhoea is one of

the common childhood illness affecting growth and survival of Indian children.

Basically, each diarrheal episode deprives the child of nutrition along with fluid loss, thus aggravating the severity of malnutrition and dehydration. Therefore this study was conducted with an aim to focus on the clinical and socio-demographic profile of infants and children presenting with acute diarrhea. The results from this study will help in a better understanding of acute diarrhea in the pediatric age group of a particular geographical region.

### Methodology

This cross-sectional study was conducted in the Department of Pediatrics, DMCH, Darbhanga, Bihar for a period of 1 year (January – December 2022). House-to-house survey was done and data was collected by interviewing the mothers of selected children from 6 months to five years. The children were selected by a systematic random sampling technique from the Anganwadis (functional unit of Integrated Child Development Scheme in India) of the villages. Every fifth child enrolled in Anganwadi was selected for the study. A total of 300 children under five were examined.

**Inclusion criteria:** Only those infants and children who fulfilled inclusion criteria such as those aged between 6 months - 5 years, suffering from acute diarrhea and presenting to the Pediatric Department at this set-up for treatment; were included in the study.

**Exclusion criteria:** Those with comorbid conditions or admitted to the PICU were excluded.

Recurrent diarrhoea was defined as > 4 to 6 episodes of acute watery diarrhoea during one year [9]. Various parameters analyzed were age and gender distribution, chief complaints, feeding practices, nutritional status and estimation of dehydration. The data was accumulated

and entered in a worksheet computer program and then exported to data SPSS version 15. For all tests, confidence level and level of significance were set at 95% and 5% correspondingly.

## Results

**Table 1: Distribution of patients according to age.**

Mean age (in years)	2.14±1.74
---------------------	-----------

**Table 2: Gender distribution of patients**

Gender	Number	Percentage
Male	156	52%
Female	144	48%
Total	300	100%

**Table 3: Duration of exclusive breast-feeding among diarrheal patients**

Duration of exclusive breastfeeding (in months)	Number	Percentage
04	48	16%
05	72	24%
06	150	50%
07	30	10%

Similarly in the case of Exclusive breast-feeding: Exclusive breastfeeding (EBF) for 6 months was given in a large no. of patients i.e. 150 (50%). 24% were given for 5 months, 16% were given for 4 months, and 10% were given for 7 months.

**Table 4: Severity of malnutrition and degree of dehydration.**

Degree of dehydration	Total no of patients	
	No	Some
No	90	36
Some dehydration	72	36
Severe dehydration	24	42
Total	186	114
	300	

A majority of patients (156, 52%) were not given bottle feeding while the remaining (144, 48%) were given. Maximum patients (126, 42%) had no dehydration whereas remaining 36% patients had some dehydration and 22% had severe dehydration.

## Discussion

In our study, analysis of the socio-demographic profile of the study population showed that a large no. of patients belonged to the toddler age group. Out of 300 patients, 52% males exceeded 48% females. Aluntas et al [10] done their study on 70 children of which 52% were females and 48% were males. Infants and

The mean age of patients was  $2.62 \pm 1.56$  years. 52 were toddlers in this group. The remaining were infants and pre-school children. Out of 300 patients 156 (52%) males exceeded 144 (48%) females.

preschool children again had a greater number of males than females. In other study by Vidjeadevan D et al, variations in male and female preponderance was observed [11]. Age group wise gender distribution in the present study had higher female than male gender among toddler age-group. Infants and preschool children again had a greater number of males than females. Chen et al and Heulan et al in their respective studies noted male predominance and majority of the patients (84%) were between 6 months to 2 years [12, 13].

The feeding practices among study participants were also noted and analyzed.

Breast-feeding was given to all 300 patients. Exclusive breast-feeding (EBF) for an ideal 6 months was noted in highest no. of study participants. Remaining patients showed EBF for 4, 5 or 7 months. Many studies have been performed for observing the effects of probiotics and feeding practices in diarrheal patients. Among human milk-fed infants, mixtures of probiotic and not single-strain products were effective in reducing late onset sepsis as well [14].

Maximum patients (126, 42%) had no dehydration whereas remaining 36% patients had some dehydration and 22% had severe dehydration. This is similar to the observations from Francavilla R et al study where control and placebo group had majority patients with no dehydration i.e. 25 and 26 respectively [15].

There are several indirect risk factors that are associated with child diarrhea and can be classified into socioeconomic, environmental and behavioral risk factors at household level and have been acknowledged by different researchers. They include: mother age, residence, education level, number of children less than five years in the household, access to toilet facilities and drinking water, wealth, work status and many others [16-20]. These risk factors intertwine between each other and can vary due to different reasons.

A study by Mihrete et al. found that the work status of the mother and the number of under five children in the household were risk factors for child diarrhea [21]. Children of working mothers had higher odds to get diarrhea as compared to children of non-working mothers also odds of diarrhea decreased when the number of under five children in the household was two or less. Gebru et al. stated that children of non-educated mothers had higher odds of getting diarrhea as compared to children whose mothers were literate [16]. Moreover, children whose families practiced improper refuse disposal

were more likely to get diarrhea compared to children whose families practiced proper refuse disposal.

## Conclusion

A slight fewer than half of the children under research had some-dehydration. Almost half of the study population goes to the toddler age group. This study can also be carried out at regular intervals to study any variations in the pattern of clinical profile of such patients. The effectiveness of treatment in these patients can also be studied in the future. Dehydration and malnutrition can also be prevented through patient education, availability of safe drinking water, adequate sanitation and hygiene.

## References

- WHO. Diarrhoeal disease. 2013 Apr. Available from: [http://www.who.int/media\\_centre/factsheets/fs330/en/](http://www.who.int/media_centre/factsheets/fs330/en/) [Accessed 7<sup>th</sup> January 2023.]
- UNICIF. Diarrhoea. 2016 Jul. Available from: [https://www.unicef.org/health/index\\_92007.html](https://www.unicef.org/health/index_92007.html) [Accessed 7<sup>th</sup> January 2023].
- Rosenberg M. Global Child Health: Burden of Disease, Achievements, and Future Challenges. Curr Probl Pediatr Adolesc Health Care. 2007 Oct;37(9): 338–62.
- N JG. Epidemiology, etiology and pathophysiology of traveler's diarrhea. Digestion. 2006;73(S1):102–108.
- Ruiz J, Olivares SV, Julian RD, Mensa L, Puyol L, Puente S. Detection of the eae gene in *Escherichia coli* isolates causing traveller's diarrhea both in atypical EPEC and in non-EPEC, non-EHEC isolates. Brit Trav Health Assoc J. 2008;12:47–48.
- World Health Organization [Internet]. WHO. Diarrhoeal disease. 2017. Available at: <https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease>. [Last accessed on 2 January, 2023].

7. UNICEF, World Health Organization. Diarrhoea: why children are still dying and what can be done. New York: UNICEF, World Health Organization; 2009. [Last accessed on 2 January, 2023].
8. One is too many: Ending child deaths from pneumonia and diarrhoea. New York, USA: United Nations Children's Fund, UNICIF; 2016 Nov. [Last accessed on 2 January, 2023].
9. Patel K, Rana R.. Pedimune in Recurrent respiratory infections-The Indian experience. *The Indian Journal of Paediatrics.* 2006;73(7):585–591.
10. Altuntaş B, Gül H, Yarali N, Ertan U. Etiology of chronic diarrhea. *Indian J Pediatr.* 1999;66(5):657–661.
11. Vidjeadevan D, Vinoth S, Ramesh S. Role of *Saccharomyces boulardii* and *Bacillus clausii* in reducing the duration of diarrhea: a three-armed randomised controlled trial. *Int J Contemp Pediatr.* 2018;5:1811-4.
12. Chen JM, Ni YH, Chen HI, Chary MH. Microbiology aetiology of acute gastroenteritis in hospitalised children in Taiwan. *J Formos Med Assoc.* 2006;105(12):964-70.
13. Heulian, Hermann J, Blackflow N. Enteric adenoviruses in children: Infection of the gastrointestinal tract. New York: Raven press; 1995:1047-1053.
14. Aceti A, Maggio L, Beghetti I, Gori D, Barone G, Callegari ML, Fantini MP, Indrio, F, Meneghin F et al. Probiotics prevent late-onset sepsis in human milk-fed, very low birth weight preterm infants: Systematic review and meta-analysis. *Nutr.* 2017;9:904.
15. Francavilla R, Lionetti E, Castellaneta S, Ciruzzi F, Indrio F, Masciale A, et al. Randomised clinical trial: *Lactobacillus reuteri* DSM 17938 vs. placebo in children with acute diarrhoea - a double-blind study. *Aliment Pharmacol Ther.* 2012;36:363-9.
16. Gebru T, Taha M, Kassahun W. Risk factors of diarrhoeal disease in under-five children among health extension model and non-model families in Sheko district rural community, Southwest Ethiopia: comparative cross-sectional study. *BMC Public Health.* 2014;14(1):395.
17. Kumi-Kyereme A, Amo-Adjei J. Household wealth, residential status and the incidence of diarrhoea among children under-five years in Ghana. *J Epidemiol Glob Health.* 2016 Sep; 6(3): 131–40.
18. Mengistie B, Berhane Y, Worku A. Prevalence of diarrhea and associated risk factors among children under-five years of age in Eastern Ethiopia: A cross-sectional study. *Open J Prev Med.* 2013;03(07):446–53.
19. Amugsi DA, Aborigo RA, Oduro AR, Asoala V, Awine T, Amenga-Etego L. Sociodemographic and environmental determinants of infectious disease morbidity in children under 5 years in Ghana. *Glob Health Action.* 2015 Dec; 8(1):29349.
20. Gascon J, Vargas M, Schellenberg D, Urassa H, Casals C, Kahigwa E, et al. Diarrhea in children under 5 years of age from Ifakara, Tanzania: a case-control study. *J Clin Microbiol.* 2000; 38(12):4459–62.
21. Mihrete TS, Alemie GA, Teferra AS. Determinants of childhood diarrhea among underfive children in Benishangul Gumuz Regional State, North West Ethiopia. *BMC Pediatr.* 2014;14(1):102.
22. Rincon V. A. D., Cuello D. R. F., Lora, J. F. V. Management of Breast Cancer During Pregnancy. *Journal of Medical Research and Health Sciences.* 2022; 5(4): 1960–1966.