

Acute Diarrhoeal Disease in Children Aged 6 Months to 24 Months: An In-Hospital Cross-Sectional Study

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ABSTRACT

Introduction: Diarrheal disease comes second among the causes of death in children under 5 years of old. We are well aware that this common disease is preventable and treatable. But the practice of preventive strategies is not as efficient as it should be. **Aims and Objectives:** 1. To determine the frequency of acute diarrheal disease in children aged 6 months to 24 months attending the immunization clinic of Lourdes Hospital, Kochi, Kerala. 2. To assess the associated factors and practices involved with acute diarrheal disease in the study group. **Material and Methods:** A cross-sectional study was done in children above 6 months attending immunization clinic in Lourdes hospital during the period from 1st October 2017 to 31st March 2019. After receiving their informed consent, a pretested, semistructured, and validated questionnaire was given to the mothers/caregivers to gather data on socio-demographic characteristics and practices. In order to assess the prevalence of diarrhea, details of the diarrheal episode after the 6 months of age were included in the questionnaire. To eliminate repeats, caution was taken not to include previously recorded data on the diarrheal episode. **Discussion and Conclusion:** The proportion of children with diarrhea in the study population was 38.7% which was high compared with other studies in the same age group. Many of the practices associated were found faulty and needing rectification which is a Family Physician's area of expertise. The study concludes that there is a need for identifying novel risk factors for diarrhea and educating the caregivers regarding the prevention of diarrhea. Primary Care Physicians/Family Physicians can play an effective role in educating the caregivers.

Keywords: 6 months to 24 months, acute diarrheal disease, exclusive breastfeeding, handwashing practices, immunization, vitamin A supplementation, zinc supplementation

Introduction

Diarrheal disease comes second among the causes of death in children under 5 years old, killing around 5,25,000 children yearly.^[1] Diarrhea may last several days, which leaves the body dehydrated and with a salt deficit. In low-income countries, children below 3 years' experience at least three episodes of diarrhea yearly.^[1] Each episode deprives the child of essential nutrients. As a result, diarrhea is a major cause of malnutrition,

and these malnourished children are more likely to fall ill during further diarrheal episodes.

For a developing country like India, a healthy young population is the greatest asset. But, we lose so many to common preventable diseases before they come of age.

We are well aware that this common disease is preventable and treatable.^[2] But the practice of preventive strategies^[1] is not as efficient as it should be. This is humbling as even in a state like Kerala, which boasts of high literacy and health awareness,^[3] our interventions and methodology fail to fill the remaining gaps. It is in this setting, a new reading, like in the study proposed, regarding the prevalence of the disease in the community, assessment of

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risk factors, and practice of preventive strategies and knowledge stands relevant.

Also, from the NHFS-4 data, it is evident that the highest prevalence of acute diarrheal disease is in the age group 6 months to 2 years.^[4] So this study is narrowed down to children of that age group as opposed to various studies in a similar setting for better assessment of the factors and practices associated with acute diarrheal disease.

Role of Primary Care Physician/Family Physician in Tackling Acute Diarrheal Diseases

A family physician is the one best equipped to counsel the mother and other family members as he/she is their first contact doctor. The family physician understands the socio-demographic factors, immunization and management strategies, faulty practices, and other risk factors. This is of essence as diarrhea in children has become an existential problem, and the turnaround time in identifying and treating it has to be drastically reduced.^[5] A family practitioner is in a better position to bring about changes that can substantially improve the burden of diarrheal disease in our community. This would help us in reducing infant mortality and morbidity in our country thereby creating a healthy future generation.

Review of Literature

Diarrhea is defined as the passage of three or more loose or liquid stools in 1 day (or more frequent passage than is normal for the person). Frequent passing of formed stools cannot be termed diarrhea, nor is the passing of “pasty” stools by breastfed babies.^[6]

Diarrhea is usually a symptom of an infection in the gastrointestinal tract, which can be caused by a variety of bacterial, viral, and parasitic organisms. Most cases of acute, watery diarrhea are caused by viruses (viral gastroenteritis) and among them the most common ones in children are rotaviruses.^[7] Infection is spread through contaminated food or drinking-water, or from person-to-person as a result of poor sanitation.^[6]

Factors determining susceptibility to diarrhea include poor sanitation and personal hygiene,^[8] poor maternal education,^[9] nonavailability of safe drinking water, unsafe food preparation practices^[1,10], and low rates of immunization.^[8,9,11-13] Additional risks are young age, measles, malnutrition,^[11] male gender,^[1] early initiation of complementary feeds,^[9] and lack of exclusive or predominant breastfeeding.^[9,12] The risks are higher with micronutrient malnutrition; in children with zinc^[14,15] and vitamin A deficiency.^[8,16]

A population-based cross-sectional study on acute diarrhea in children below 5 years of age in South India by Meriton Stanly *et al.*^[8] was published in June 2009. The study found out a high prevalence of acute diarrhea in the age group 7 to 24 months (40.7% in 7 months to 12 months age group and 32.1% in 12 months to 24 months age group) compared with the overall incidence of 22.5% in children below 5 years age.

Aims and Objectives

- To determine the frequency of acute diarrheal disease in children aged 6 months to 24 months attending immunization clinic of Lourdes Hospital, Kochi, Kerala.
- To assess the associated factors and practices involved with acute diarrheal disease in the study group.

Material and Methods

Inclusion Criteria

- Children between the age 6 months and 24 months.
- Children attending immunization clinic at Lourdes Hospital, Kochi.
- Mother's consent to participate in the study.

Exclusion Criteria

- Children with a diagnosed malabsorption disorder such as celiac disease, lactose intolerance, fructose malabsorption, short bowel syndrome secondary to surgery/resection of the bowel (as diagnosed by their pediatrician).
- Those (mothers of infants) who were not willing to participate in the study.

Study Design

This was a cross-sectional study. The sample size is calculated by the formula

$$n > \frac{Z^2 PQ}{d^2}$$

where **n**: Sample size

p: Rate of prevalence in the population.

q = 1- p

z: Confidence coefficient for 95% confidence interval

d: Error of the estimate

By taking *P* as 22.5%^[8] and with a confidence of 95% with an error of estimate of 10%, the minimum sample size worked out for this study is 67. We could collect 142 samples in the study period.

The study group included children who attended the immunization clinic in Lourdes hospital in the aforementioned time period who are above 6 months of age.

A brief introduction was given to the mothers/caretaker of the child regarding the purpose of the study. After getting their informed consent, a pre-tested, semi-structured validated questionnaire, was given. In order to assess the prevalence of diarrhea, details of the diarrheal episode after the 6 months of age were included in the questionnaire. To eliminate repeats, caution was taken not to include previously recorded data on the diarrheal episode, if such a situation arose where previously interviewed

child came for the subsequent visit as per immunization schedule, during the study period.

All data were entered in Excel 2010, and statistical analysis was performed using the statistical software SPSS 25.0. The data were expressed as number (with percentages) and mean values (with standard deviations). The differences between the groups were analyzed with the independent sample t-test (Student's t-test) for mean and Pearson's Chi-square test/ Fisher's exact test for proportions. The results were defined as statistically significant when the *P* value (2-sided) was less than 0.05.

Ethical Considerations

Ethical clearance for this study was obtained from the institute's ethics committee on 10th August 2017. An informed written consent was taken from all the mothers of infants. By this study, no additional financial burden was incurred to the participants by means of interventions or investigations as the information was collected solely from the questionnaire which was given to the caretakers of the children participating in the study. The investigator provided counseling to participants as and when required.

Limitations of the Study

The study is confined only to the study of the prevalence of acute diarrheal disease and associated socio-demographic factors. The socio-demographic factors and the risk factors were self-reported by parents of the study population, hence may suffer from over- and under-reporting and recall bias. This study survey was cross-sectional, and hence no causal inferences can be made.

Conclusions

A total of 142 children participated in the study in the period between 1st October 2017 and 31st March 2019 after applying the inclusion and exclusion criteria.

Sociodemographic Factors

Out of the 142 children who participated in the study, 79 were male children constituting 55.6%, and 63 were female children constituting 44.4%. A total of 55 children had diarrheal episodes constituting 38.7% which is high when compared with peer studies. The male children had higher episodes of diarrhea (58.2%) compared with female children (41.8%). In children having diarrhea, lesser episodes were found in children taken care of by persons more than 30 years of age. While comparing the educational status of mothers and diarrhea in their children, both the groups (children with diarrhea and children without diarrhea) had comparable results. The majority of mothers in the study group had at least secondary education. With a *P* value of more than 0.05, these results were not statistically significant.

Factors Associated with Immunization

The immunization status of the children was comparable in both children with diarrhea and children without diarrheal episodes. The majority of children in both with or without diarrheal episodes have taken measles immunization. In both groups (children who had and did not have diarrhea), the immunization with rotavirus vaccination was less. Only one-third of the study population had rotavirus vaccination coverage. [Figure 1a]. None of the factors studied related to immunization were found to be statistically relevant as *P* values were not less than 0.05.

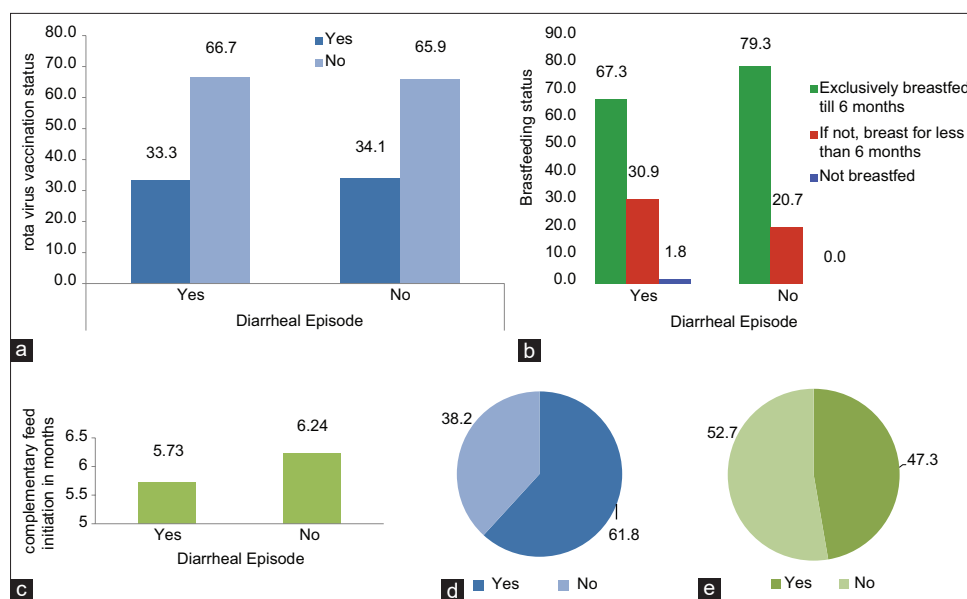


Figure 1: (a) Graph showing the relation between rotavirus vaccination and diarrheal episodes. (b) Graph relating diarrheal episodes and the breastfeeding practices. (c) Graph showing the relation between the incidence of diarrhea and complementary feeding practices. (d) Pie diagram showing the proportion of children given ORS during diarrhoea. (e) Pie diagram showing the proportion of children who were given zinc during the episode

Factors Associated with Feeding Practices

In the exclusively breastfed category, the diarrheal episodes were found to be slightly higher [Figure 1b]. But there was no significant reduction in the frequency in exclusively breastfed and nonexclusively breastfed categories. In the population with diarrhea, the mean initiation of complementary feeding was found to be 5.73 months; and in those without diarrhea, the mean initiation was found to be 6.24 months [Figure 1c]. It was noted that when complementary feeding was started earlier than 6 months, diarrheal episodes were slightly more. But both these couldn't be linked statistically as *P* values were more than 0.05.

Practices Followed in Management of Diarrhea

In both categories (with and without diarrhea), the majority had been supplemented with vitamin A. With a *P* value of more than 0.05, this result was not statistically significant. A total of 61.8% of the children were given ORS, and 38.2% were not given ORS after diarrheal episodes [Figure 1d]. A total of 47.3% of children were given zinc, and 52.7% were not given zinc after the episode [Figure 1e].

Diarrheal Episodes and Handwashing Practices

In the group with diarrhea, 63.36% did not follow good handwashing practices, and 36.4% followed good handwashing practices. In the group without diarrhea, 57.5% did not follow good handwashing practices and 42.5% followed good handwashing practices. *P* value was found to be 0.465.

Risk Factors Associated with Diarrhea

In the group with diarrhea, 52.7% did not have quality drinking-water, and 47.3% had good quality drinking-water. In the group without diarrhea, 64.4% did not have quality drinking water and 35.6% had good quality drinking water. In both the groups, the majority (98.6%) had their own latrine and only 1.4% had a common latrine. But both these could not be linked statistically as *P* values were more than 0.05.

Key Findings and Recommendations

1. The incidence of diarrhea is high in this age group compared with peer studies. This calls for more studies in the same age group. As incidence in male children of the age group is more, we have to prioritize case seeking amongst them without ignoring girl children while during treatment.
2. There is a need for larger and longer duration studies to ascertain the relation of factors influencing diarrhea in Southern India, especially in urban and semiurban settings.
3. Rotavirus vaccination coverage in the study population was low. Better implementation of strategies for increasing coverage is needed.
4. Practices associated with diarrhea are below par as noted in the study. Handwashing practices and water handling practices in the community need to be reviewed and altered.
5. More studies are needed to determine the factors influencing the faulty practices of the caregiver.

6. Family Physicians can play a significant role in the implementation of the above recommendations by educating caregivers of children. The role of Family Physicians have become all the more important in the present setting where even in educated strata, children affected by diarrhea is high. As a Family Practitioner is the one who has primary contact with them, he/she is the ideal candidate to identify and evaluate the risk and also alleviate and treat them appropriately.

Declaration of Patient Consent

The authors certify that they have collected all appropriate participant consent forms. In the form, the participants have given their consent for their clinical information to be published. The patients understand that their details will not be published.

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Nil.

Conflicts of Interest

There are no conflicts of interest.

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