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BURDEN OF ROTAVIRAL DIARRHEAL CASES AT TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Rotavirus is highly contagious, with a very low infective dose of fewer than 100 virus particles. These viruses are shed in high concentrations in the feces of infected children and can spread through feco-oral routes, fomites, close person-to-person contact, and even through fecally contaminated food, water, and respiratory droplets. **Material & Methods:** The present cross sectional, prospective study was carried out at department of Pediatric, at our tertiary care hospital. The study duration was of six months from July 2017 to December 2017. In this prospective study we enrolled 100 children of age up to 5 years presented at outpatient department with a diagnosis of acute watery diarrhea and enrolled by simple random sampling. **Results:** In the present study, out of total enrolled participants, on the basis of clinical diagnosis it was found that 30% children were diagnosed with Rota viral diarrhea and 60% children were diagnosed with non-rota viral diarrhea. On the basis of comorbidities among rotaviral diarrheal cases it was found that 44% children had mild diarrhea, 34% children had moderate diarrhea and 22% children had severe diarrhea. 70% children had vomiting, 60 % children had fever and 70% children were lethargic. There was no mortality reported in present study. **Conclusion:** We concluded from the present study that; rotavirus is a public health concern. Proper surveillance is essential to determine the exact prevalence of the disease, both among admitted children in hospitals and those in the community.

Keywords: Rotavirus, Acute diarrhea, Dehydration.

INTRODUCTION:

Diarrhea remains a significant cause of mortality among children, particularly in developing countries, where an estimated 1.87 million deaths of children under 3 years are attributed to this condition annually **(1).** Globally, this number rises to approximately 140 million deaths, with up to 85% occurring in low-income countries **(2).** In India alone, out of over 2.3 million annual deaths among children, around 334,000 are linked to diarrheal diseases, with the majority attributed to rotavirus **(3).**

Rotavirus is highly contagious, with a very low infective dose of fewer than 100 virus particles **(4).** These viruses are shed in high concentrations in the feces of infected children and can spread through feco-oral routes, fomites, close person-to-person contact, and even through

fecally contaminated food, water, and respiratory droplets **(5).**

Rotavirus-induced diarrhea is a leading cause of hospitalizations, primarily affecting children over 3 months of age, with most experiencing the infection by the age of 3-4 years **(6).** Initial infections tend to be more severe, while subsequent exposures typically result in milder symptoms. Infants below 3 months, older children, and adults may be asymptomatic carriers of the virus. Dehydration is a common complication associated with rotavirus infection **(7).**

Despite advancements in sanitation, the incidence of rotaviral infections remains unaffected. However, the development of two effective rotavirus vaccines has shown promise in reducing the incidence of severe dehydration associated with the infection **(8).** This study aims to assess the prevalence of rotavirus infection in our tertiary care hospital, contributing to efforts aimed at better understanding and managing this disease.

MATERIALS & METHODS

The present cross sectional, prospective study was carried out at department of Pediatric, at our tertiary care hospital. The study duration was of six months from July 2017 to December 2017.

A sample size of 100 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.3. In this prospective study we enrolled 100 children of age up to 5 years presented at outpatient department with a diagnosis of acute watery diarrhea and enrolled by simple random sampling.

Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent from their mother and father for the study was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time.

Patients with dysentery or diarrhea for more than14 days, children with antibiotic induced diarrhea of disease were excluded from the present study. These cases were investigated as per study guideline and follow up period was of 1 months. All data were entered in the MS office 2010 spread sheet and Epi Info v7.

Data analysis was carried out using SPSS v22. Qualitative data was expressed as percentage (%) and Pearson's chi square test was used to find out statistical differences between the study groups and sensitivity, specificity, positive predictive value and negative predictive value were calculated.

If the expected cell count was < 5 in more than 20% of the cells then Fisher's exact test was used. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05 and highly significant if p value less than 0.01.

RESULTS

In the present study, we enrolled 100 children of age up to 5 years presented at outpatient department with a diagnosis of acute watery diarrhea by simple random sampling.

Out of the total enrolled children 54% were males and 46% were females. Mean weight of study participants was 14.3 ± 1.2 kg. Out of total, 18% were in group of less than 1 years, 22% were in the age group of 1-2 years, 23% were in the age group of 2-3 years, 19% were in the age group of 3-4 years and 18% were in the age group of 4-5 years. (Table 1)

Table 1: Distribution of study participants according to study parameters.

Parameters		No. of patients
Gender	**Male**	54%
	Female	46%
Age group	**< 1years**	18%
	1-2 years	22%
	2-3years	23%
	3-4 years	19%
	4-5	18%

In the present study, out of total enrolled participants, on the basis of clinical diagnosis it was found that 30% children were diagnosed with Rota viral diarrhea and 60% children were diagnosed with non-rota viral diarrhea There was no mortality reported in present study. (Table 2)

Table 2: Distribution of study participants according to clinical diagnosis.

Parameters	No. of patients
Rota viral diarrhea	40%
Non- rota viral diarrhea	60%

In the present study, out of total enrolled participants, on the basis of comorbidities among rotaviral diarrheal cases it was found that 44% children had mild diarrhea, 34% children had moderate diarrhea and 22% children had severe diarrhea. 70% children had vomiting, 60 % children had fever and 70% children were lethargic. (Table 3)

Table 3: Distribution of study participants according to comorbidities among rotaviral diarrheal cases.

Comorbidities		No. of patients
Diarrhea	Mild	44%
	Moderate	34%
	Severe	22%
Vomiting		70%
Fever		60%
Lethargy		70%

DISCUSSION

In the present study, we enrolled 100 children of age up to 5 years presented at outpatient department with a diagnosis of acute watery diarrhea by simple random sampling. Out of the total enrolled children 54% were males and 46% were females. Mean weight of study participants was 14.3 ± 1.2 kg. Out of total, 18% were in group of less than 1 years, 22% were in the age group of 1-2 years, 23% were in the age group of 2-3 years, 19% were in the age group of 3-4 years and 18% were in the age group of 4-5 years. Similar findings were reported in a study conducted by Umesh D et al conducted to assess

the children with acute watery diarrhea and found that Rotavirus disease disproportionately affects children in the poorest countries, with 82% of rotavirus-related deaths occurring in these regions. The staggering incidence of rotavirus highlights the critical need for interventions, such as vaccines, especially in developing nations, to prevent childhood deaths **(9).**

In the present study, out of total enrolled participants, on the basis of clinical diagnosis it was found that 30% children were diagnosed with Rota viral diarrhea and 60% children were diagnosed with non-rota viral diarrhea There was no mortality reported in present study. Similar findings were reported in a study conducted by Jacqueline E et al conducted to assess the children with acute watery diarrhea and found that in children under the age of 5, diarrhea is responsible for 37% of deaths and accounts for 5% of all deaths in this age group. This statistic underscores the significant impact of diarrhea on child mortality, highlighting the importance of effective prevention and treatment strategies to reduce these alarming numbers **(10).**

In the present study, out of total enrolled participants, on the basis of comorbidities among rotaviral diarrheal cases it was found that 44% children had mild diarrhea, 34% children had moderate diarrhea and 22% children had severe diarrhea. 70% children had vomiting, 60 % children had fever and 70% children were lethargic. Similar findings were reported in a study conducted by Anand T et al conducted to assess the children with acute watery diarrhea and found that 57 samples tested for rotavirus double-stranded RNA pattern, 46 samples underwent further testing for subgroup and serotype specificities. Among these 46 strains, 29 were identified as subgroup II, while the remaining 17 strains were categorized as subgroup I. This suggests that subgroup II strains are more prevalent than subgroup I strains in the tested samples **(11).**

CONCLUSION

We concluded from the present study that; rotavirus is a public health concern. Proper surveillance is essential to determine the exact prevalence of the disease, both among admitted children in hospitals and those in the community. This will enable us to take proactive measures to prevent its spread. Conducting more detailed surveillance with a larger number of cases is crucial to demonstrate the efficacy of interventions such as breastfeeding and vaccines in reducing the burden of rotavirus infection among children.

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