

Detection of VP6 Antigen in Children with Rota Virus Gastroenteritis

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Abstract

Background: To detect the VP6 antigen in children with Rota virus gastroenteritis. **Subjects and Methods:** One hundred twenty- nine children aged less than 5 years were selected in the study. Detection of rotavirus antigen in stool samples was done with by ELISA. In this test, monoclonal antibodies against the product of the sixth viral gene (VP6) were used in a sandwich-type method. **Results:** Positive cases were 46 (65%) males and 25 (35%) females. Mothers having high school/college education has 52, primary/middle school had 10 cases and those having nil education had 9 Rota virus positive cases. 3 cases had father's occupation as Daily wages worker, 48 had permanent job and 20 had temporary job. 28% cases were first born and 72% were late born. There were 10 cases having breast feeding habits, 40 cases had formula feeding and 21 had mix feeding habit. **Conclusion:** VP6 rotavirus antigen was detected in stools of children having gastroenteritis.

Keywords: Gastroenteritis, Rotavirus Antigen, Daily Wages.

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Introduction

The burden of diarrhoea caused by rotavirus infection in the Pediatric population is a major cause of concern worldwide. It is estimated that in 2008, rotavirus diarrhea or rotavirus gastroenteritis (RVGE) resulted in 453,000 deaths worldwide in children aged less than 5 years, which accounted for 5% of all deaths in this age group.^[1] India accounted for approximately 22% of world RVGE deaths (98,621 deaths) in children aged less than 5 years. The morbidity and mortality associated with acute gastroenteritis was high in children and elderly. Thus, rotavirus has been recognized as the most important cause of severe dehydrating diarrhea in young children in both developed and developing country.^[2]

Although the exact etiological fractions of diarrhea in developing countries are a subject of much research, there are indications that rates of various bacterial diarrhea may be decreasing. Improvements in oral rehydration solution (ORS) use and access to healthcare have contributed to impressive gains in diarrheal mortality.^[3] Discovering drugs to treat rota virus infection was a failure and sanitation and hygiene improvements did not have much impact in decreasing the rate of rotavirus diarrhea though it had tremendous impact in reducing bacterial and parasitic diarrheal disease.^[4] Previously it was thought that transmission was exclusively

through feco oral route but persistence of Rota virus in high income settings and increase in Rota virus diarrhea cases after improved sanitation and hygienic conditions and rapid acquisition of serum antibody in the first two years of life suggested a possibility of transmission through respiratory route.^[5] This study was conducted to detect the VP6 antigen in children with Rota virus gastroenteritis.

Subjects and Methods

A sum total of one hundred twenty- nine children aged less than 5 years were selected in the study. Inclusion criteria was all out- patient and in patient cases with watery diarrhea not greater than one week of admission. Exclusion criteria were those children whose parents did not give consent. Children with bloody diarrhea and nosocomial gastroenteritis acquired during hospital stay for other diseases were also excluded from the study. Diarrhea was defined as passing of 3 or more liquid stools per day. Informed consent was taken from all parents.

Data such as history, clinical examination, vaccination details were recorded in case history proforma. Stool sample was collected and transported to the lab and iodine and saline wet mount was done to rule out any parasites. The sample was processed in special media like Wilson blair and alkaline peptone water to rule out vibrio cholera, Tetrathionate broth

to culture salmonella and Selenite F Broth for salmonella and shigella, Deoxycholate citrate agar. Then sample was collected and stored in the refrigerator. All the samples despite the presence or absence of other enteropathogens were tested for Rota virus.

Detection of rotavirus antigen in stool samples was done with by ELISA. In this test, monoclonal antibodies against the product of the sixth viral gene (VP6) were used in a sandwich-type method. The statistical analysis were carried out using Statistical package for social sciences (SPSS) software. A p value<0.05 was considered as statistically significant.

Results

Table 1: Parasites positive cases gender wise distribution

Parasites positive cases	Number	Percentage
Male	46	65
Female	25	35

[Table 1] shows that positive cases were 46 (65%) males and 25 (35%) females.

Table 2: Education of mother and rota virus positive cases (n=71)

Education of mother	Rota virus positive cases	%
High school/college	52	73
Primary/middle school	10	14
Nil	9	13

[Table 2] shows that mothers having high school/college education has 52, primary/middle school had 10 cases and those having nil education had 9 Rota virus positive cases.

Table 3: Occupation of father and rota virus positive cases (n=71)

Occupation of father	Rota virus positive cases	%
Daily wages worker	3	4
Permanent job	48	68
Temporary job	20	28

[Table 3] shows that 3 cases had father’s occupation as Daily wages worker, 48 had permanent job and 20 had temporary job.

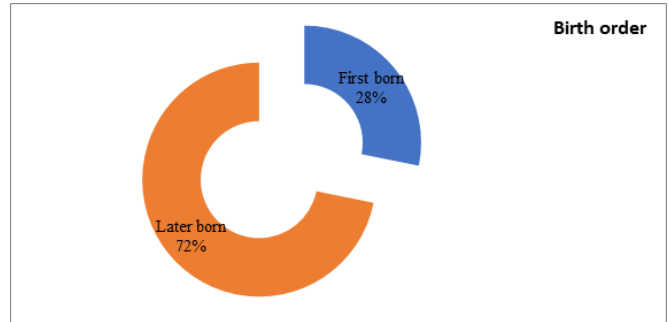


Figure 1: Distribution of patients with rota virus diarrhea according to birth order

[Figure 1] shows that 28% cases were first born and 72% were late born.

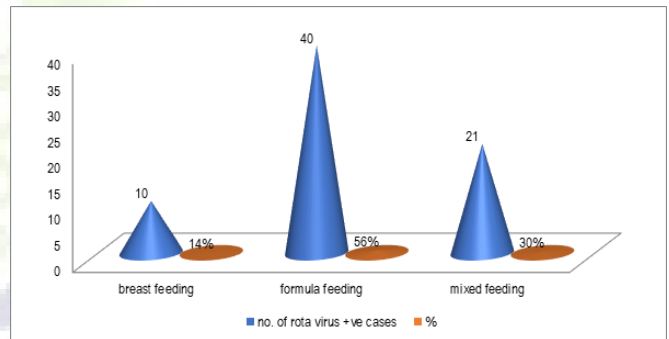


Figure 2: Correlation between Rota virus positive cases and type of feeding

[Figure 2] shows that there were 10 cases having breast feeding habits, 40 cases had formula feeding and 21 had mixed feeding habit.

Discussion

Rota virus diarrhea is quite common children less than 5 years of age. This study was conducted to detect the VP6 antigen in children with Rota virus gastroenteritis. We found that positive cases were 46 (65%) males and 25 (35%) females. A study conducted by Leon w Nitemia et al in Burkino Faso showed large increase in diarrheal cases which was due to rota virus infections in the cold dry period from December to February. The study also showed high incidence of parasitic infections during the rainy season.^[6] The present study also showed higher incidence of parasitic infection during the rainy season. But bacterial infections were found in the cool dry months in the study conducted in Burkino Faso. This result is not supported by our study in which bacterial infections

was evenly distributed throughout the year. In another study conducted in Punjab rota virus infection has been observed throughout the year with maximum occurrence in November and another peak in the hot and dry months of May.^[7]

The study conducted by Shobha et al in AIMS Delhi showed high prevalence of rota virus in the winter months.^[8] A study conducted in Thirupathi also showed the prevalence of rota virus diarrhea during the cooler dry months.^[8,9] Regarding seasonal- ity, some studies in India have found no association between rotavirus infection and the time of year. Other studies have observed an increase in rotavirus-associated diarrhea during the winter months, October-February, throughout the coun- try.^[10,11] Rotavirus was markedly seasonal in northern India but was less seasonal in southern locations with a more tropi- cal climate¹². In the present study, although the number of cases increased from December to April, there was uneven distribu- tion throughout the year.^[12]

In our study we compared the risk factors for acquiring rota virus infection in different age groups and found that in children less than 6 months the prevalence was low. Maximum number of rota virus positive cases were seen in the age group (12-23 months) 29% and (24-35 months) 38%. A study conducted by Leon w. Nitiema et al in Burkino Faso,^[13] showed that rota virus diarrhea was common in younger children (<12 months). Similar results have been observed in case of parasites being more common in older children (>12months) while diarrhea due to bacteria were equally prevalent among all age groups.^[14]

We found that 28% cases were first born and 72% were late born. There were 10 cases having breast feeding habits, 40 cases had formula feeding and 21 had mix feeding habit. Our study showed that those infants that were breast fed had less chance of acquiring rota virus infection compared to non-breast fed and formula fed children. In another epidemiological study conducted by Phukan et al,^[14] for prevention of rota virus disease in India it was found that most rota virus diarrhea occurred in the first two years of life.

Conclusion

VP6 rotavirus antigen was detected in stools of Rota virus positive children with gastroenteritis.

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