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Incidence of Rota Virus Gastroenteritis Among Children Below 5 years with Diarrhea

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Abstract

Background: Diarrheal illness had a huge impact globally as it became the third most common cause of death in children younger than 5 years, accounting for almost 1.5 million deaths annually or 18% of all deaths in this age group death taking the greatest toll in developing countries. This study is being conducted to study the incidence of Rota virus gastroenteritis among children below 5 years with diarrhea. **Subjects and Methods:** Stool samples from children <5years with watery diarrhea were enrolled in the study. Immediately after stool collection it was transported to the lab and iodine and saline wet mount was done to rule out any parasites. The sample were also 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. **Results:** 129 cases of diarrhea were included in the study of which 71 ie. 55% was Rota virus positive. Among the 71 Rota virus positive cases 65% were males and 35% were females. There were 21 male and 12 female bacterial cases. Salmonella was identified in 20 (60%) and shigella in 13 (40%) of cases. **Conclusion:** The study conducted here has shown that 55% of the 129 diarrheal cases included in the study was due to rota virus infection. The study shows that number of bacterial and parasitic infection are less compared to rota virus infection and more over it can be treated with medication and severity of diarrhea and dehydration is also not as high as seen in case of rota virus infection.

Keywords: Diarrhea, Salmonella, ROTA virus.

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Introduction

Diarrheal illness had a huge impact globally as it became the third most common cause of death in children younger than 5 years, accounting for almost 1.5 million deaths annually or 18% of all deaths in this age group death taking the greatest toll in developing countries.[1] The World health organization (WHO) and UNICEF estimate that almost 2.5 billion episodes of diarrhea occur annually in children <5 years of age in developing countries.[2] With the use of antibiotics and oral rehydration therapy global mortality is declining but the overall incidence of diarrhea remains unchanged.[3,4]

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.[5,6] *Alth*ough 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.[7] There is very little information on the long-term consequences of diarrheal diseases, especially persistent or prolonged diarrhea and subsequent malnutrition. Diarrheal illnesses can have a significant impact on psychomotor and cognitive development in young children.[8] Early and repeated episodes of childhood diarrhea during periods of critical development, especially when associated with malnutrition, co-infections, and anemia, can have long-term effects on linear growth, as well as on physical and cognitive functions. So there is an urgent need to curb this illness by taking adequate precautionary measures like vaccination and awareness campaigning to bring down the mortality and morbidity associated with ROTA virus diarrhea.[9,10] This study is being conducted to study the incidence of Rota virus gastroenteritis among children below 5 years with diarrhea.

Subjects and Methods

All cases of diarrhea in children aged less than 5 years were enrolled in the study and stool sample collected. The study was approved by the Ethical committee of our college.

Stool samples from children <5 years with watery diarrhea were enrolled in the study. WHO defines diarrhea as passing of 3 or more liquid stools per day. Informed consent was taken from the patient and sterile container provided. Clinical history, vaccination details and other relevant information was collected from the patient's parents or guardians and noted in a proforma.

Immediately after stool collection it was transported to the lab and iodine and saline wet mount was done to rule out any parasites. The sample were also 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. 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: Enteropathogens identified in children suffering from acute diarrhoea (n=129)

Enteropathogens	No of positives	%
Rota virus	71	55
parasites	23	18
bacterial	33	26
unknown	2	1

[Table 1] shows that 129 cases of diarrhea were included in the study of which 71 ie. 55% was Rota virus positive.

Table 2: Rota virus positive cases gender wise distribution (n=71)

Rota virus positive cases	Number	Percentage
Male	46	65
Female	25	35

[Table 2] shows that among the 71 Rota virus positive cases 65% were males and 35% were females.

[Table 3] shows that there were 21 male and 12 female bacterial cases.

[Figure 1] shows that salmonella was identified in 20 (60%) and shigella in 13 (40%) of cases.

Table 3: Bacterial cases gender wise distribution (n=33)

Bacterial cases	Number	Percentage
Male	21	64
Female	12	36

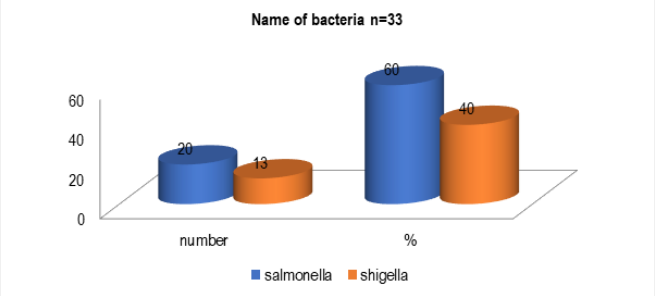

Figure 1: Bacteria identified in children suffering from diarrhea (n=33)

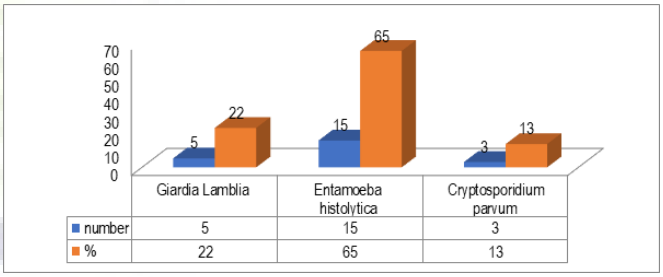

Figure 2: Parasites identified in children suffering from diarrhea

Discussion

Rota virus diarrhea has been recognized as the major cause of child mortality and morbidity in both developing and developed countries. The current study was done to know the prevalence of Rota virus diarrhea in and around Pondicherry. children less than 5 years who came to the Outpatient department was enrolled in the study. Results of this study confirm that Rota virus is a major cause of gastroenteritis among Indian children in the outpatient setting as 55% of the children had ROTA virus diarrhea.

The current study shows that Rota virus infection is present all through- out the year except February 2015 and March 2015 with peaks in the cooler months October, November and December.

In our study we compared the risk factors for acquiring rotavirus infections in different age groups and found that in children less than 6 months the prevalence was low 2%.

Table 4: Comparison of predominant clinical features among the diarrheal cases

Clinical features	ROTA virus n=71	%	Parasite n=23	%	Bacteria n=33	%
fever	71	100	2	9	3	9
vomiting	71	100	3	13	27	81
diarrhoea	71	100	23	100	33	100

Maximum number of ROTA virus positive cases were seen in the age group (12-23 months) 29% and (24-35 months) 38%. Similar results have been observed in the case of parasites being more common in older children (>12months), while bacteria were equally prevalent among all age groups. In another epidemiological study conducted by Kelkar et al for prevention of rota virus disease in India it was found that most rota virus diarrhea occurred in the first two years of life.[11]

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. Thus, my study supports the fact that exclusive breast feeding has a protective on acquiring rota virus infection. It could also be due to the inability of neonates to infect themselves through their fingers that the rate of rota virus diarrhea is lower in the breast- fed children.

Cases were prior antibiotic or antiparasitic drug therapy is taken could also be another reason for not able to isolate the enteropathogen. Even chronic antibiotic use can lead to diarrhea were no pathogen will be detected.

Conclusion

The study conducted here has shown that 55% of the 129 diarrheal cases included in the study was due to rota virus infection. The study shows that number of bacterial and parasitic infection are less compared to rota virus infection and more over it can be treated with medication and severity of diarrhea and dehydration is also not as high as seen in case of rota virus infection.

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