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ORIGINAL RESEARCH

Prevalence of Rota virus gastroenteritis among immunised and non immunised children below 5 years

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ABSTRACT

Background: To assess the prevalence of Rota virus gastroenteritis among immunised and unimmunised children below 5 years and to assess the prevalence of complications among Rotaviral gastroenteritis.

Materials and Methods: Eighty- six cases of gastroenteritis in children aged less than 5 years were enrolled and demographic data of each patient, immunization history, clinical history and other relevant information was collected. Stool collection was done and sample was processed in special media, Wilson blair and alkaline peptone water. All the samples were tested for Rota virus. Prevalence of complications in rotaviral gastroenteritis assessed using clinical examination and radiological and laboratory parameters**.**

Results: Out of 86 patients, Rota virus was seen in 46, parasites in 24, bacteria in 10 and unknown in 6 cases. The difference was significant (P< 0.05). Among the total 46 children with rotaviral gastroenteritis, 10 were immunised for rotavirus and 36 were unimmunised. The difference was statistically significant(P <0.05). There were 25 males and 21 females among Rota virus positive cases. The difference was non- significant (P> 0.05) (Table II). Rota virus positive and Rota virus negative cases, duration of diarrhea was 0-4 days in 5 and 8, 5 days in 7 and 20, 6-7 days in 34 and 12. Vomiting was seen in 30 and 24. Duration of vomiting in days (1) was seen in 10 and 18, (2) in 22 and 12 and (3) in 14 and 10. Fever was seen in 34 and 15 and blood in stools seen in 20 and 10 cases . Dehydration was mild in 14 and 18, moderate in 6 and 10, severe in 10 and 8 and very severe in 16 and 4 respectively. Children with rotaviral gastroenteritis had higher rate of intussusception presenting in 12 out of 46 children whereas children with non rotaviral gastroenteritis had only one case of intussusception among 40. The prevalence of complications was more in rotaviral gastroenteritis than others. The difference was significant (P< 0.05) (Table III, graph I).Duration of stay in the hospital was 10 days in average for rotaviral gastroenteritis when

compared to other infectious causes where the stay was 5 days in average. The difference was statistically significant ($p<0.05$).

Conclusion: There was high prevalence of Rota virus infection in unimmunised children less than 5 years with gastroenteritis and the prevalence of complications were high among rotaviral affected children. In conclusion, rotaviral vaccination prevents gastroenteritis associated with severe complications which affect the quality of life in children below 5 years.

Keywords: Children, Diarrhea, rotavirus gastroenteritis, Fever.

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INTRODUCTION

Diarrhea is a major cause of morbidity and mortality in children under 5 years. It accounts for 22% of global rotavirus gastroenteritis (RVGE) related deaths worldwide. It is the second leading cause of death in children under 5 years with 10% deaths each year.[1] Among the etiologic agents of diarrhea, viruses are the most common causes in 80% of cases. Rotavirus is a major contributor of AGE and causes about 40% of hospitalizations for diarrhea in children under 5 years of age.[2]

The introduction of the rotavirus vaccine has significantly reduced the incidence of hospitalizations and severe gastroenteritis in childhood.[3] Still, however, rotavirus infection was responsible for more than 258 million episodes of diarrhea and over 128 000 deaths among children.[4] rotavirus has been recognized as the most important cause of severe dehydrating diarrhea in young children in both developed and developing country.[5,6]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.[7] There is very little information on the long-term consequences of diarrheal diseases, especially persistent or prolonged diarrhea and subsequent malnutrition.[8] Diarrheal illnesses can have a significant impact on psychomotor and cognitive development in young children.[9] This study assessed the prevalence of Rota virus gastroenteritis among children below 5 years with diarrhea.

Aim: To assess the prevalence of Rota virus gastroenteritis among immunised and unimmunised children below 5 years and to assess the prevalence of complications among Rotaviral gastroenteritis.

MATERIALS & METHODS

A sum total of eighty- six cases of gastroenteritis in children aged less than 5 years were enrolled in the study. The study was approved by the Ethical committee. All parents agreed for their wards being selected for the study.

After recording the demographic data of each patient, clinical history , immunization history and other relevant information was collected. Immediately stool collection was done and sample were processed in special media, 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 were tested for Rota virus. Prevalence of complications in

rotaviral gastroenteritis assessed using clinical examination and radiological and laboratory parameters.

The statistical analysis was done using statistical package for social sciences (SPSS) software. A p value<0.05 was considered as statistically significant.

RESULTS

Table I Enteropathogens in children suffering from acute diarrhoea

Enteropathogens	Number	P value
Rota virus	46	0.01
parasites	24	
bacterial	10	
unknown	6	

Out of 86 patients, Rota virus was seen in 46, parasites in 24, bacteria I 10 and unknown in 6 cases. The difference was significant (P< 0.05) (Table I).

Table II Gender wise distribution

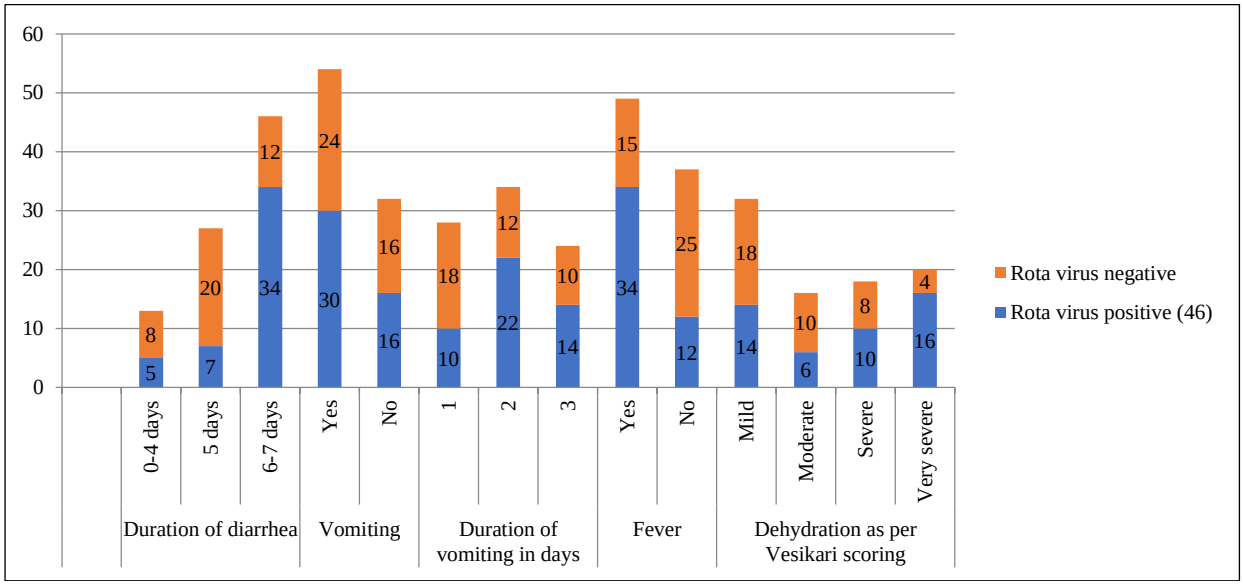
Rota virus positive cases	Number	P value
Male	25	0.91
Female	21	

There were 25 males and 21 females Rota virus positive cases. The difference was non-significant (P> 0.05) (Table II).

Table III Assessment of parameters

Parameters	Variables	Rota virus positive (46)	Rota virus negative (40)	P value
Duration of diarrhea	0-4 days	5	8	0.01
	5 days	7	20	
	6-7 days	34	12	
Vomiting	Yes	30	24	0.17
	No	16	16	
Duration of vomiting in days	1	10	18	0.05
	2	22	12	
	3	14	10	
Fever	Yes	34	15	0.12
	No	12	25	
Dehydration	Mild	14	18	0.03
	Moderate	6	10	
	Severe	10	8	
	Very severe	16	4	
Blood in stools		20	10	0.04
Intussusception		12	1	0.01
Duration of hospital stay		10	5	0.05
Rotavirus immunised		10	33	0.04

Rota virus positive and Rota virus negative cases, duration of diarrhea was 0-4 days in 5 and 8, 5 days in 7 and 20, 6-7 days in 34 and 12. Vomiting was seen in 30 and 24. Duration of vomiting in days (1) was seen in 10 and 18, (2) in 22 and 12 and (3) in 14 and 10. Fever was seen in 34 and 15. Dehydration was mild in 14 and 18, moderate in 6 and 10, severe in 10 and 8 and very severe in 16 and 4 respectively. The difference was significant (P< 0.05) (Table III, graph I).



Graph I Assessment of parameters

DISCUSSION

This study assessed the prevalence of Rota virus gastroenteritis among children below 5 years with diarrhea.[10,11] In India, according to National Family Health Survey (NFHS-4) report prevalence of diarrhea among under-5 y children was 9.2% which is very high.[12] India accounts for an estimated 457,000–884,000 hospitalizations and over 2 million outpatient visits for diarrhea resulting in total direct costs of Indian Rupee (INR) 10.37 billion per year. Out of these, 78,000 deaths occur due to rotavirus and among them, 76% of children are less than 24 mo of age.[14,15]

Our study revealed that out of 86 patients, Rota virus was seen in 46, parasites in 24, bacteria in 10 and unknown in 6 cases. Sharma et al[16] studied epidemiological profile, prevalence, and molecular epidemiology of RVGE in hospitalized under 5 children. Out of total 851 included children, rotavirus gastroenteritis (RVGE) was detected in 23.03% (196/851) cases by EIA. The highest incidence for RVGE-positive cases (40.43%) was observed in 2016 with gradual decline over next 3 y. Maximum cases of diarrhea were observed in 12–23 mo age group along with highest rotavirus detection. G3P[8] was most common genotype (46.94%) found, followed by G1P[8] (13.78%), G2P[4] (4.59%), G1P[6] (8.16%) and G9P[4] (3.57%). Mixed genotype was seen in 13.78% of total cases.

Among the total 46 children with rotaviral gastroenteritis, 10 were immunised for rotavirus and 36 were unimmunised. The difference was statistically significant(P <0.05). There were 25 males and 21 females Rota virus positive cases. Rota virus positive and Rota virus negative cases, duration of diarrhea was 0-4 days in 5 and 8, 5 days in 7 and 20, 6-7 days in 34 and 12. Vomiting was seen in 30 and 24. Duration of vomiting in days (1) was seen in 10

and 18, (2) in 22 and 12 and (3) in 14 and 10. Fever was seen in 34 and 15 and blood in stools seen in 20 and 10 cases . Dehydration was mild in 14 and 18, moderate in 6 and 10, severe in 10 and 8 and very severe in 16 and 4 respectively. Gupta et al[17] found that out of 958 admissions of under-five children with diarrhea, 239 stool samples were collected during study period. Rotavirus antigen was detected in 18.8% (45/239) of the stool samples. Majority (84%) of children with rotavirus diarrhea were less than one year of age. Duration of diarrhea varied from 1 to 60 days. About 36% children had a history of diarrhea for 1 day, and 23% had it for two days. The mean duration of hospital stay of enrolled children was 3.6 days. Rotavirus infection was significantly higher (58%) during colder months. Children with Rotaviral gastroenteritis had higher rate of intussusception presenting in 12 out of 46 children whereas children with non rotaviral gastroenteritis had only one case of intussusception among 40. The prevalence of complications was more in rotaviral gastroenteritis than others. The difference was significant ($P< 0.05$) (Table III, graph I).Duration of stay in the hospital was 10 days in average for rotaviral gastroenteritis when compared to other infectious causes where the stay was 5 days in average. The difference was statistically significant ($p<0.05$).

CONCLUSION

Results of the study revealed that there was high prevalence of Rota virus infection in rotaviral unimmunised children less than 5 years with diarrheal infection and the prevalence of complications were high among rotaviral affected children. In conclusion, rotaviral vaccination prevents gastroenteritis associated with severe complications which affect the quality of life in children below 5 years.

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