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Original Research Article

Gender Distribution among Children in Rotavirus Gasteroenteritis Diarrhea in Chennai

Ponnambalam Arun[1,2], Kaveri Krishnasami[3], Palani Gunasekeran[3], Vidya Padmanabhan[2]
[1]Research Scholar, R&D, Bharathiar University, Coimbatore-641046.
[2]Department of Microbiology, PG & Research, D.G. Vaishnav College, Arumbakkam, Chennai, Research Supervisor, Bharathiar University, Coimbatore-641046.
[3]Department of Virology, King Institute of Preventive Medicine & Research, Guindy, Chennai-600032.

***Corresponding author**
Kaveri Krishnasami & Ponnambalam Arun
Email: arunpatchai@yahoo.co.in

Abstract: Diarrhoea is a major public health problem throughout the world and in developing countries, and prevalence of diarrhoea has not changed for the past years and remains as the third largest leading cause of deaths among children of under five years age. Human rotavirus A remains still as the major cause of diarrhea in children below 5 years of age. Since very less data is available on rotavirus disease burden, and deaths among children in South India, especially in Chennai. This study highlights the presence of rotavirus diarrhoea among the children and analyze the gender difference among the affected children. A total of 100 Children under five years of age group presenting with diarrhoea, admitted to hospitals were randomly selected for this cross –sectional study. The stool specimens of these children presented with watery diarrhoea were collected and transported to the laboratory within 24 hours of sample collection and were detected by Enzyme Immuno Assay. The prevalence of rotavirus infection was found to be 40%, among them male were affected than females. Statistical analysis using SPSS version 21 showed a p value <0.03which has been found to be significant. This study showed that presence rotavirus was high among children admitted to hospital due to diarrhea in Chennai. This increase in HRVA detection helps in better understanding of rotavirus disease among children in Chennai and will provide data for giving vaccination in routine immunization schedule.
Keywords: Rotavirus, Gastroenteritis, EIA, RNA virus, Prevalence.

INTRODUCTION

Group A rotavirus has been reported to be the leading cause of infantile gasteroenteritis worldwide which accounts for 1 in 9 child deaths worldwide. HRVA is the leading causative agent among the diarrheal deaths in children under five years of age [1].

Rotaviruses are comprised of 11 segments with double stranded RNA as their genetic material. Among various proteins and genes NSP4 plays a vital in enterotoxin which is responsible for diarrhea and this is the first viral enterotoxin discovered [2].

In India, Rotavirus associated (in the absence of immunization programme) gasteroenteritis diarrheal deaths there is an estimation of 1, 00,000 deaths reported [3]. Studies conducted in different parts of India have identified the prevalence ranged between 13.2 and 63% [4]. Here we present the prevalence of rotaviral infection among children and their gender difference during the study period.

MATERIALS AND METHODS

This cross – sectional study was done among 100 children during January 2014 to July 2014, admitted to hospitals due to diarrhoea in the age group of 0-5 years. Children admitted for other than diarrhoea, diarrhoea obtained after hospital admission, fever for more than 14 days were excluded. Children with fever, diarrhoea, vomiting under the age of 5 years were included in the study. Institutional Ethical Clearance was obtained. Informed consent has been obtained. General and abdominal examination was done for them by the medical professionals. The stool samples were obtained from the children using a sterile container, and the collected samples were transported in ice (4°C) to the laboratory. The collected samples were transported within 24 hours and analyzed at King Institute of Preventive Medicine and Research at Grade I laboratory, using ELISA and PCR for detection of rotavirus antigen. The obtained data were analyzed using standard statistical methods in SPSS software version 21. The statistical tests used were Chi square test, Fishers exact test.

RESULTS

Rotavirus was detected in (40/100) 40% of fecal samples by Enzyme Immuno Assay (EIA) among children with acute diarrhoea. P values <0.05 were considered statistically significant (our result p = 0.03). Rotaviral diarrhoea remains a major cause of hospitalizations and we found boys had a greater risk than girls among the hospitalized children. The gender distribution is shown in Table 1.The gender difference of the study sample is shown in Figure 1.

Table-1: Gender Distribution of Rotaviral Diarrhoea

GENDER	POSITIVE	NEGATIVE	TOTAL	p value
MALE	27	35	62	0.03*
FEMALE	13	25	38	
Total	40	60	100	

p value <0.05 – significant * - significant

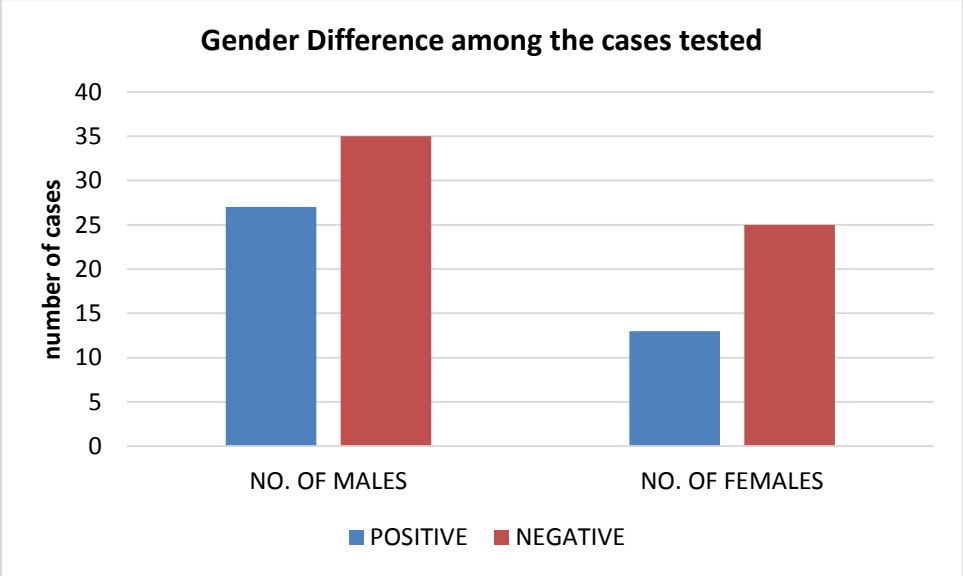

Fig-1: Gender Difference among the cases tested

DISCUSSION

Diarrheal disease is one of the commonest causes of death in children in developing countries and rotavirus has been consistently identified as the commonest pathogen associated with severe diarrhea.

Many different agents, including viruses, bacteria, and parasites, of which viruses have been intensively studied in recent years, can cause acute diarrhea. The most notable viral agents causing diarrhea are rotavirus, adenovirus, astrovirus, and Norwalk-like viruses [5]. Rotavirus is a leading cause of infantile gastroenteritis worldwide and is responsible for approximately 20% of diarrhea-associated deaths in children under 5 years of age [6]. Bishop *et al*. first identified rotaviruses in humans in 1973 [7]. When they observed characteristic particles in the cytoplasm of duodenal epithelial cells from young children admitted to the hospital for treatment for acute diarrhea.

In our study of 100 children presenting with diarrhea, 40% were found to be positive for rotavirus antigen in their stool samples that is relevant to previous studies [8]. Gender difference of boys are affected than girls which has been stated by Bass *et al*. [9] which coincides with our study.

From a Vietnamese study during 2001 to 2002 out of 836 children states that males are affected more than females [10]. Various studies from China [11] also reports higher male ratio than females among the HRVA affected children. During 2011 a Nigerian study also reports of male infectivity than females [12]. Study by Riza Durmaz have found that there is male predominance than female in rotaviral gasteroenteritis [13].

CONCLUSION

The rotavirus prevalence of 40% makes it an important public health issue particularly in view of its significant association with the severe forms of diarrhea. We have limited our study to EIA and further studies towards molecular and genetic characterization will give us a detailed data of the strains that is prevalent in Chennai. Rotavirus diarrhea does not have any specific treatment and repeat infections are common.

Recommendations

It has been seen that with good hygiene and sanitation, bacterial and parasitic diarrhea have declined

considerably but there has been less of an impact on rotavirus disease.

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