

# ORIGINAL ARTICLE

## Assessment of cases of viral gastroenteritis in children

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### ABSTRACT:

**Background:** Viral gastroenteritis, often referred to as the stomach flu or stomach bug, is a common illness characterized by inflammation of the gastrointestinal tract. The present study was conducted to assess cases of viral gastroenteritis in children. **Materials & Methods:** 102 patients with viral gastroenteritis of both genders were included. Details of diarrhea, presence of fever, vomiting and clinical signs and symptoms of dehydration were collected. **Results:** Out of 102 patients, males were 60 and females were 42. There were 72 hospitalized and 30 non-hospitalized patients. Aetiology was rotavirus in 48 and 15, norovirus in 14 and 10, sapovirus in 7 and 4 and astrovirus in 3 and 2 in hospitalized and non-hospitalized patients respectively. Clinical features fever in 65 and 23, vomiting in 41 and 19 and dehydration in 34 and 12 in hospitalized and non-hospitalized patients respectively. The difference was significant ( $P < 0.05$ ). **Conclusion:** In both hospitalized and out-of-hospitalized children with acute gastroenteritis, rotavirus was the predominant viral pathogen. In a small percentage of hospitalized children, other viruses such as norovirus, sapovirus, and astrovirus were discovered to be related to acute gastroenteritis.

**Key words:** viral gastroenteritis, diarrhea, fever

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### INTRODUCTION

Viral gastroenteritis, often referred to as the stomach flu or stomach bug, is a common illness characterized by inflammation of the gastrointestinal tract. This condition is primarily caused by various viruses. Noroviruses are highly contagious and are a leading cause of gastroenteritis outbreaks, especially in places like cruise ships, schools, and healthcare facilities.<sup>1</sup> Rotavirus primarily affects infants and young children, causing severe diarrhea and vomiting. Vaccines have been developed to prevent rotavirus infections. Some strains of adenovirus can cause gastroenteritis, but they are less common than norovirus and rotavirus. Astrovirus infections are more common in young children, but they can affect people of all ages. Sapovirus is similar to norovirus and can cause gastroenteritis, often in outbreaks.<sup>2</sup> Symptoms of viral gastroenteritis typically include diarrhea, vomiting, nausea, stomach cramps or pain, low-grade fever, muscle aches, headache etc.<sup>3</sup> The symptoms usually appear 1-2 days after exposure to the virus and can last for several days, with the severity varying depending on the specific virus and the individual's overall health. Dehydration is a significant concern with viral gastroenteritis, especially in children and the elderly.<sup>4</sup> It's essential to stay hydrated by drinking clear fluids like water, oral

rehydration solutions, and clear broths. Most cases of viral gastroenteritis resolve on their own without the need for medication. Treatment mainly involves managing symptoms and preventing dehydration. In severe cases or cases with complications, medical attention may be necessary.<sup>5</sup> The present study was conducted to assess cases of viral gastroenteritis in children.

### MATERIALS & METHODS

The present study consisted of 102 patients with viral gastroenteritis of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Details of diarrhoea, presence of fever, vomiting and clinical signs and symptoms of dehydration were collected from either patient's records. Stool sample was collected. At least 10 ml of liquid, watery stool and one sample per patient was collected in a clean and dry screw capped, wide mouth plastic container. Samples from the hospital were transported to the laboratory immediately. ELISA for rotavirus group specific antigen (VP6) detection was done by a commercial kit. Data thus obtained were subjected to statistical analysis. P value  $< 0.05$  was considered significant.

## RESULTS

**Table I Distribution of patients**

Total- 102		
Gender	Male	Female
Number	60	42

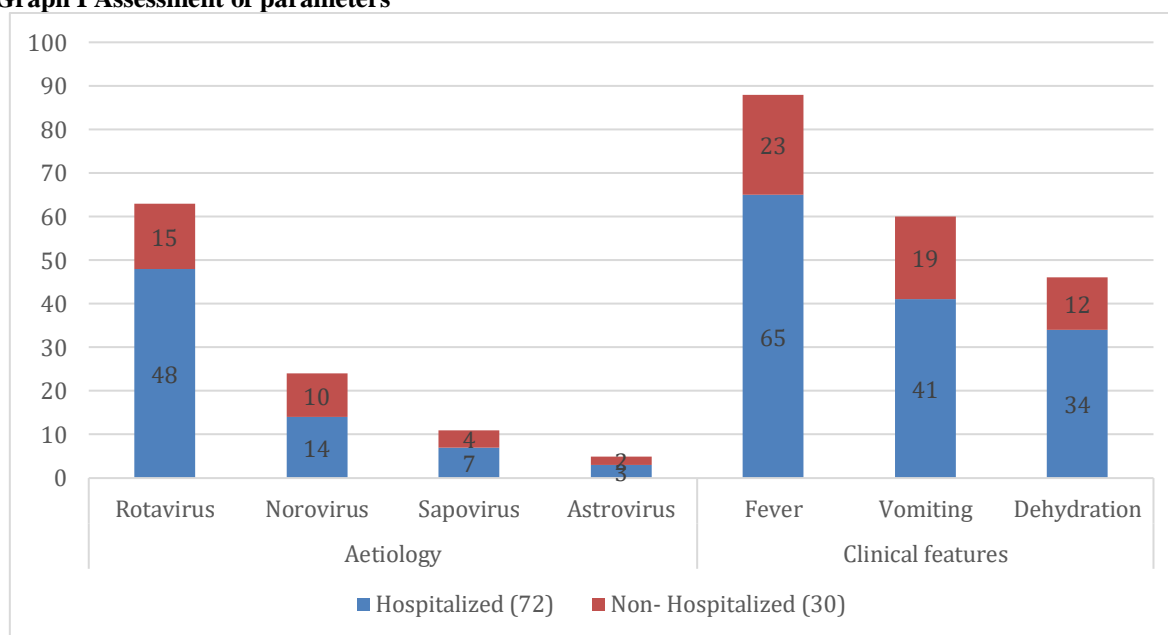
Table I shows that out of 102 patients, males were 60 and females were 42.

**Table II Assessment of parameters**

Parameters	Variables	Hospitalized (72)	Non- Hospitalized (30)	P value
Aetiology	Rotavirus	48	15	0.01
	Norovirus	14	10	
	Sapovirus	7	4	
	Astrovirus	3	2	
Clinical features	Fever	65	23	0.05
	Vomiting	41	19	
	Dehydration	34	12	

Table II, graph I shows that there were 72 hospitalized and 30 non- hospitalized patients. Aetiology was rotavirus in 48 and 15, norovirus in 14 and 10, sapovirus in 7 and 4 and astrovirus in 3 and 2 in hospitalized and non- hospitalized patients respectively. Clinical features fever in 65 and 23, vomiting in 41 and 19 and dehydration in 34 and 12 in hospitalized and non- hospitalized patients respectively. The difference was significant ( $P < 0.05$ ).

**Graph I Assessment of parameters**



## DISCUSSION

One of the most prevalent childhood illnesses, particularly in underdeveloped nations, is acute gastroenteritis. Enteric infections are thought to be responsible for 2.5 million annual deaths, with children under the age of five bearing a disproportionate burden.<sup>6</sup> As aetiological agents for gastroenteritis, more than 20 different varieties of viruses have been identified. The primary agents are thought to be group A rotaviruses, which are followed by calicivirus, adenovirus, and astrovirus.<sup>7</sup> To prevent the spread of viral gastroenteritis, practice good hygiene, such as frequent handwashing with soap and water, avoiding close contact with infected individuals, and disinfecting contaminated surfaces.<sup>8</sup>

Additionally, vaccines are available for certain viruses that cause gastroenteritis, such as the rotavirus vaccine for infants.<sup>9,10</sup> The present study was conducted to assess cases of viral gastroenteritis in children.

We found that out of 102 patients, males were 60 and females were 42. Gupta et al<sup>11</sup> in their study a total of 278 stool samples from equal number of children were tested for rotavirus antigen using ELISA and for norovirus, sapovirus and astroviruses by reverse transcription (RT)-PCR. Of the 169 samples from hospitalized patients, rotavirus, norovirus, sapovirus and astrovirus were detected in 19.5, 2.3, 3.5 and 2.9 percent samples, respectively. Of the 109 samples collected from the non-hospitalized patients,

frequency of rotavirus and sapovirus detection was 9.1 and 1.8 per cent, respectively while norovirus and astrovirus were not detected.

We found that there were 72 hospitalized and 30 non-hospitalized patients. Aetiology was rotavirus in 48 and 15, norovirus in 14 and 10, sapovirus in 7 and 4 and astrovirus in 3 and 2 in hospitalized and non-hospitalized patients respectively. Clinical features fever in 65 and 23, vomiting in 41 and 19 and dehydration in 34 and 12 in hospitalized and non-hospitalized patients respectively. Sdiri-Loulizi et al<sup>12</sup> investigated the incidence and the clinical role of various enteric viruses responsible for infantile gastroenteritis in 632 Tunisian children presenting in dispensaries (380 children) or hospitalized (252 children) for acute diarrhea. At least one enteric virus was found in each of 276 samples (43.7%). A single pathogen was observed in 234 samples, and mixed infections were found in 42 samples. In terms of frequency, rotavirus and norovirus were detected in 22.5 and 17.4% of the samples, respectively, followed by astrovirus (4.1%), Aichi virus (3.5%), adenovirus types 40 and 41 (2.7%), and sapovirus (1.0%). The seasonal distribution of viral gastroenteritis showed a winter peak but also an unusual peak from May to September. The severity of the diarrhea was evaluated for hospitalized infants. No significant differences were observed between rotavirus and norovirus infections with regard to the incidence and the clinical severity of the disease, especially in dehydration.

Nag et al<sup>13</sup> determined the prevalence of rotavirus infection in children between 2 months to 2 years of age. Enzyme Linked Immunosorbent Assay (ELISA) and Polyacrylamide Gel Electrophoresis (PAGE) were used for detection of rotavirus from stool sample. Fourteen (15.6%) of them were found to be positive for group A rotavirus, 9 (23%) cases were between 6 months to 1 year of age. Rotavirus excretion was highest (50%) when all three symptoms (diarrhea, vomiting and fever) occurred in the same child. The limitation of the study is the small sample size.

## CONCLUSION

Authors found that in both hospitalized and out-of-hospitalized children with acute gastroenteritis, rotavirus was the predominant viral pathogen. In a small percentage of hospitalized children, other viruses such as norovirus, sapovirus, and astrovirus were discovered to be related to acute gastroenteritis.

## REFERENCES

1. Money NN, Maves RC, Sebeny P, Kasper MR4, Riddle MS. the AFHSC-GEIS Enteric Surveillance Writing Group. Enteric disease surveillance under the

- AFHSC-GEIS: Current efforts, landscape analysis and vision forward. *BMC Public Health*. 2011;11:572–11.
2. Andreasi MS, Cardoso Dd, Fernandes SM, Tozetti IA, Borges AM, Fiaccadori FS, et al. Adenovirus, calicivirus and astrovirus detection in fecal samples of hospitalized children with acute gastroenteritis from Campo Grande, MS, Brazil. *Mem Inst Oswaldo Cruz*. 2008;103:741–4.
3. Mishra V, Awasthi S, Nag VL, Tandon R. Genomic diversity of group A rotavirus strains in patients aged 1-36 months admitted for acute watery diarrhoea in northern India: a hospital-based study. *Clin Microbiol Infect*. 2010;16:45–50.
4. Noel JS, Lee TW, Kurtz JB, Glass RI, Monroe SS. Typing of human astroviruses from clinical isolates by enzyme immunoassay and nucleotide sequencing. *J Clin Microbiol*. 1995;33:797–801.
5. Nair GB, Ramamurthy T, Bhattacharya MK, Krishnan T, Ganguly S, Saha DR, et al. Emerging trends in the etiology of enteric pathogens as evidenced from an active surveillance of hospitalized diarrhoeal patients in Kolkata, India. *Gut Pathog*. 2010;2:4.
6. Kang G, Arora R, Chitambar SD, Deshpande J, Gupte MD, Kulkarni M, et al. Multicenter, hospital-based surveillance of rotavirus disease and strains among Indian children aged <5 years. *J Infect Dis*. 2009;200(Suppl 1):147–53.
7. Sdiri-Loulizi K, Gharbi-Khe'lfifi H, de Rougemont A, Chouchane S, Sakly N, Ambert-Balay K, et al. Acute infantile gastroenteritis associated with human enteric viruses in Tunisia. *J Clin Microbiol*. 2008;46:1349–55.
8. Rachakonda G, Choudekar A, Parveen S, Bhatnagar S, Patwari A, Broor S. Genetic diversity of noroviruses and sapoviruses in children with acute sporadic gastroenteritis in New Delhi, India. *J Clin Virol*. 2008;43:42–8.
9. Pativada MS, Chatterjee D, Mariyappa NS, Rajendran K, Bhattacharya MK, Ghosh M, et al. Emergence of unique variants and inter-genotype recombinants of human astroviruses infecting infants, children and adults in Kolkata, India. *Int J Mol Epidemiol Genet*. 2011;2:228–35.
10. Verma H, Chitambar SD, Gopalkrishna V. Astrovirus associated acute gastroenteritis in western India: predominance of dual serotype strains. *Infect Genet Evol*. 2010;10:575–9.
11. Gupta S, Singh KP, Jain A, Srivastava S, Kumar V, Singh M. Aetiology of childhood viral gastroenteritis in Lucknow, north India. The Indian journal of medical research. 2015 Apr;141(4):469.
12. Sdiri-Loulizi K, Gharbi-Khe'lfifi H, de Rougemont A, Chouchane S, Sakly N, Ambert-Balay K, et al. Acute infantile gastroenteritis associated with human enteric viruses in Tunisia. *J Clin Microbiol*. 2008;46:1349–55.
13. Nag VL, Khare V, Awasthi S, Agrawal SK. Clinical profile and prevalence of rotavirus infection in children presented with acute diarrhea at tertiary care referral hospital at northern part of India. *J Commun Dis*. 2009;41:183–8.