

# Incidence of Rotavirus Diarrhea in Children Under 6 years Referred to the Pediatric Emergency and Clinic of Ghaem Hospital, Mashhad, Iran

Ali Sadeghian<sup>\*1</sup>, Abdolkarim Hamed<sup>2</sup>, Mohammad Sadeghian<sup>3</sup>, and Hamed Sadeghian<sup>4</sup>

<sup>1</sup> Department of Medical Bacteriology & Virology, Microbiology and Virology Research Centre, Ghaem University Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>2</sup> Department of Pediatric, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>3</sup> Department of Cardiology, Tehran Heart Center, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

<sup>4</sup> Department of Pathology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

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**Abstract-** Rotavirus is the most important pathogen responsible for acute diarrhea in infants and young children. The incidence of rotavirus infection was studied in 156 children less than six years of age who were suffering from acute gastroenteritis, between February 22, 2006 and February 21, 2007 in Mashhad. Rotavirus antigen was detected by latex agglutination test (Rotascreen) in 28.8% of the stool samples examined. The frequency of rotavirus infection was significantly higher among patients under 24 months of age (69%) than among children two years old or more (31%). The peak of incidence was in the winter. This study revealed that rotavirus is an important etiological agent of acute gastroenteritis among children in Mashhad.

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**Key words:** Diarrhea; rotavirus; latex fixation tests

## Introduction

Rotavirus is the most important etiological agent of serious dehydrating diarrhea among infants and young children. Outbreaks of rotavirus infection are common among infants and young children in hospitals, day-care centers and schools. Such outbreaks result in both clinical and subclinical cases, and premature and underweight babies are most likely to develop serious infections. The virus is usually shed in the faeces for five to seven days. In severe cases, rapid dehydration can lead to renal shutdown and death (2).

Each year, rotavirus causes approximately 111 million episodes of gastroenteritis requiring only home care, 25 million clinic visits, 2 million hospitalizations, and 352,000-592,000 deaths (median, 440,000 deaths) in children <5 years of age. By age 5, nearly every child will have an episode of rotavirus gastroenteritis, 1 in 5 will visit a clinic, 1 in 65 will be hospitalized, and approximately 1 in 293 will die. Children in the poorest countries account for 82% of rotavirus deaths (3). The purpose of this study was to assess the rate of rotavirus

infection among children less than six years of age with acute gastroenteritis years referred to the pediatric emergency and clinic of Ghaem Hospital, Mashhad.

## Patients and Methods

A total of 156 male and female children less than six years of age referred with acute diarrhea were studied in the laboratory of microbiology of Ghaem Hospital, Mashhad between February 22, 2006 and February 21, 2007. Stool samples were obtained and were frozen and stored at -20 °C until processing. A commercial Latex Agglutination Test (M80 Rotascreen, Microgen, England) was used to test the faeces of patients for the presence of rotavirus antigen, according to the manufacturer's instructions.

## Results

A total of 45(28.8%) episodes of acute gastroenteritis were associated with rotavirus antigen detection ( $p < 0.001$ ).

**\*Corresponding Author:** Ali Sadeghian

Department of Medical Bacteriology & Virology, Microbiology and Virology Research Centre, Ghaem University Hospital, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran  
Tel: +98 915 1164126, Fax: +98 511 8409612, E-mail: sadeghiana@mums.ac.ir

**Table 1.** Age prevalence of enteric pathogens in 156 young children and infants with acute diarrhea in Mashhad

Age group	Patient No	No. infected with Rotavirus	Positive rate(%)
0-4.9	8	3	37.5
5-9.9	26	5	19.2
10-14.9	30	10	33.3
15-19.9	29	10	34.4
20-24.9	19	3	15.7
25-29.9	3	2	66.6
30-34.9	10	7	70
35-39.9	10	3	30
40-44.9	0	0	0
45-49.9	0	0	0
50-54.9	9	1	11.1
55-59.9	0	0	0
60-64.9	0	0	0
65-69.9	7	1	14.2
70-74.9	5	0	0
Total	156	45	28.8

**Table 2.** Prevalence of Rotavirus infection by sex among acute diarrhea cases

Sex	No. tested	No. positive	Positive(%)
Male	83	25	30.1
Female	73	20	27.4
Total	156	45	28.8

The frequency of detection of rotavirus in faeces among children less than six years of age with acute diarrhea is shown in Table 1.

The majority of rotavirus infection cases (31 cases or 69%) occurred in children under 24 months of age. The highest incidence of diarrhea caused by rotavirus (33.3%) was in children between 5 and 15 months of age. The median age of patients was 18 months. There was a significant difference between the rates of infection in children fewer than 24 months of age with children older ( $p < 0.001$ ). There wasn't a significant difference between rotavirus diarrhea in females under six years old (27.4%) and males (30.1%) of the same age (Table 2).

A possible relationship between the occurrence of rotavirus infection and seasons was investigated. The rates of rotavirus infection were 30.4% in the spring, 30.4%, in summer, 15.8% in autumn 33.3% and in winter 44.2%, with a significant difference between infection rates in the winter and other seasons ( $P = 0.004$ ) (Table 3).

**Table 3.** Seasonally incidence of rotavirus in the stool of patients with acute gastroenteritis in Mashhad

Season	No. tested	No. positive	Positive(%)
Spring	23	7	30.4
Summer	63	10	15.8
Autumn	15	5	33.3
Winter	52	23	44.2
Total	156	45	28.8

## Discussion

Rotavirus is a major enteropathogen throughout the world, affecting mainly children less than five years of age in both industrial and developing countries (4).

Rotavirus was detected in 11-71% of children with diarrhea. The present study shows that the overall rate of rotavirus infection was 28.8% in children with diarrhea. These results agree with those obtained by other workers in developing countries (Ethiopia, India, Mexico, Brazil and Turkey), which record a prevalence of 25% in infection cases (5-8).

As documented by other studies, most of the cases of rotaviral diarrhea occur in children less than two years of age. (9) However, the highest incidence of rotavirus diarrhea in this study occurred in children aged 5 to 15 months. This is similar to the incidence in other developing countries where rotavirus is a prevailing pathogen among infants aged less than 24 months. In

most parts of the world, rotavirus is present throughout the year, which suggests that low-level transmission could maintain the chain of infection. The virus is spread by the faecal-oral route, but airborne or droplet transmission has also been postulated.

During the period of the present study rotavirus infections occurred throughout the year, but the greatest number of rotavirus cases was identified between September and November. Some rotavirus infections have been called a winter disease in the temperate zones, we found that their incidence peaked in the winter months. The results of this study indicate that rotavirus is a major etiological agent of acute diarrhea in infants and young children in Mashhad.

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