

## The Effect of Rotavirus on Severe Acute Diarrhea in Iraqi Children Aged 4-8 Years

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**Abstract:** This paper aims to assessment The effect of rotavirus on severe acute diarrhea in Iraqi children aged 4-8 years and knowing the risk factors that affect the mortality rate in this study. In this study, 77 pediatric patients were collected to know the effect of rotavirus on severe acute diarrhea in Iraqi children aged 4-8 years from different hospitals in Iraq in the period between 2019-January to February 2020 and the suspected cases in this study were children who had suffered from diarrhea for five days due to the influence of rotavirus. The results which found in this study were collect from 77 children diagnosed with rotavirus distributed according to sex for 43 boys and 34 girls; in this research, the effect of rotavirus on the Degree of dehydration in children was revealed, as 55 pediatric patients for moderate dehydration with 71%, severe dehydration in 22 patients with 29%. In this research, an assessment of outcomes according to mortality was conducted, and 11 children were found with 14.2% Dying, and living for 66 patients with 85.7% also analyzed person correlation between mortality with variables of origin, sex, and age and were found There is a direct statistically significant relationship with Rural, Girls, and ages ranging from 4 to 6 years with a p-value < 0.05

**Keywords:** Diarrhoea, Children, Rotavirus, Severe, Infection, IBM, Radial pulse.

### INTRODUCTION

Rotaviruses are the most common cause of gastroenteritis in children worldwide. Acute diarrhea is always dangerous in children [WHO, 2004], but the differences in clinical symptoms make it possible to identify therapeutic indications that apply to all cases. [Onis, M. *et al.*, 1997; Katona, P. *et al.*, 2008] Rotavirus is a virus that causes gastroenteritis. Symptoms include severe diarrhea, vomiting, fever, and dehydration. Nearly all children in the United States are likely to be infected with rotavirus before the age of five. [Soenarto, Y. *et al.*, 2009; Prasetyo, D. *et al.*, 2015]

In previous studies related to the effect of rotavirus on severe acute diarrhea in Iraqi children aged 4-8 years on persistent vomiting and diarrhea between three and eight days. It is estimated to cause 111 million outpatient diarrhea cases annually. [Prasetyo, D. *et al.*, 2010] Two million hospitalizations and between 352,000 to 592,000 deaths of children under the age of five. Up to the age of 5 years, it is estimated that 1205 children die every day due to this virus, and more than 82% of them come from poor countries. [Ndze, V.N. *et al.*, 2012]

Rotavirus is the main causative agent that causes acute diarrhea in childhood and affects practically all children of the first four years of age. They are more common in cases requiring hospitalization

and are the main factor causing diarrhea in hospitals in pediatric reception units [Douti, M. *et al.*, 2019]. Enter viruses and astroviruses produce a milder clinical picture. [Mwenda, J.M. *et al.*, 2010; Stewen, K.E. *et al.*, 1993]

Rotavirus is the main causative agent that causes acute diarrhoea in childhood and affects practically all children of the first four years of age. [Djeneba, O. *et al.*, 2011] They are more common in cases requiring hospitalization and the main factor causing diarrhea in hospitals in pediatric reception units. Enteroviruses and astroviruses produce a milder clinical picture. [Boukougou, I.J. *et al.*, 2010]

Rotaviruses infect the cylindrical epithelium of the villi of the small intestine, where the development of the virus occurs within a few hours or days. [Parez, N. *et al.*, 2012] As a result of virus replication, the destruction of mature intestinal cells occurs with their replacement by immature cells, which leads to the atrophy of the ciliated epithelium. [Patel, M.M. *et al.*, 2013] Rotavirus infection is ubiquitous and occurs in all age groups. In the structure of acute intestinal infections, the percentage of gastroenteritis with rotavirus varies from 9 to 73%, depending on age, region, the standard of living, and season. Children of the first years of life are often sick (mainly from 6 months to 2 years) [Hassine-Zaafrane, M. *et al.*,

2011]. Rotaviruses are one of the causes of diarrhea with severe dehydration in children under three years of age, and this infection is responsible for up to 30-50% of all cases of diarrhea requiring hospitalization or severe dehydration. [Kargar, M. et al., 2011]

**PATIENT AND METHOD**

A cross-sectional study was conducted on Iraqi children aged between 4 to 8 years who were diagnosed with rotavirus. Seventy-seven children were recruited in this study from different hospitals in Iraq in the period between 2019-January to February 2020 and. The suspected cases in this study were children who had suffered from diarrhea for five days due to the influence of rotavirus.

In this research, clinical symptoms were diagnosed, which represented a sharp increase in temperature (it can reach very high rates, for example, 39 degrees and above), Severe and moderate diarrhea, and abdominal pain.

Once informed concurrence was attained from the parents or legal guardians of the suspected cases, the platoon progressed to record on a questionnaire predefined by the public surveillance program of rotavirus diarrhea in children under five times of

age, data related to age, coitus, period of the occasion of rotavirus diarrhea (month and time), place of hearthstone, functional signs associated with the diarrhea, and hydration status. also, coprolite samples were collected for original examination in the guard point laboratory for group A rotavirus antigen by enzyme immunoassay (EIA) using the Pro Spec T™ Rotavirus Microplate Assay

**STATISTICAL ANALYSIS**

In this study, it was based on the statistical analysis program IBM SOFT SPSS 22 to analyse the results and demographic characteristics related to patients, where the value of the standard regression and the arithmetic mean were represented. The statistical differences were also analysed through P VALUE < 0.05, and a Pearson correlation analysis was performed between mortality and the variables of this study

**OBJECTIVE OF RESEARCH**

This paper aims to assessment The effect of rotavirus on severe acute diarrhea in Iraqi children aged 4-8 years and knowing the risk factors that affect the mortality rate in this study.

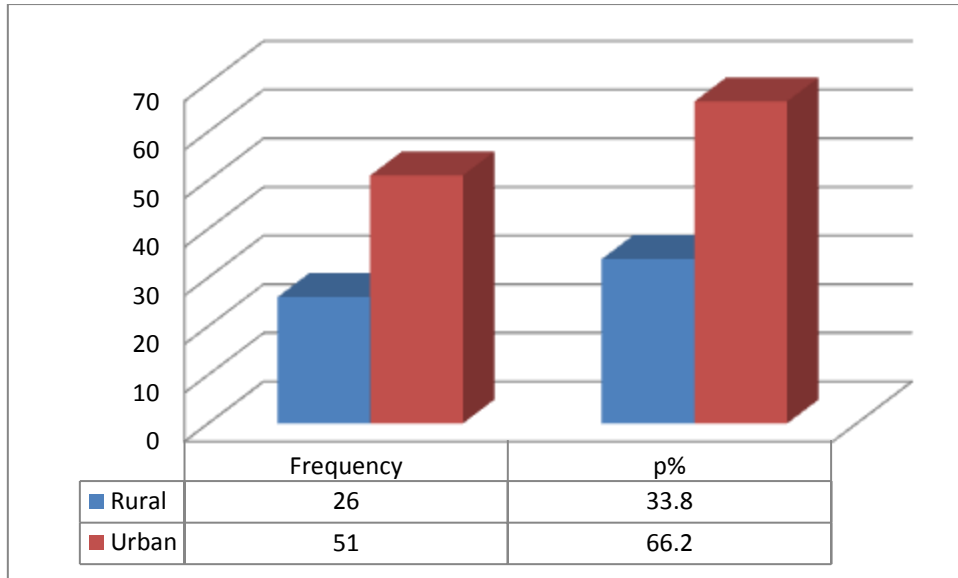
**RESULTS**

**Table 1:** Distribution of patients according to age

Age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4.00	10	13.0	13.0	13.0
	5.00	9	11.7	11.7	24.7
	6.00	13	16.9	16.9	41.6
	7.00	29	37.7	37.7	79.2
	8.00	16	20.8	20.8	100.0
	Total	77	100.0	100.0	

**Table 2:** Distribution of patients according to sex

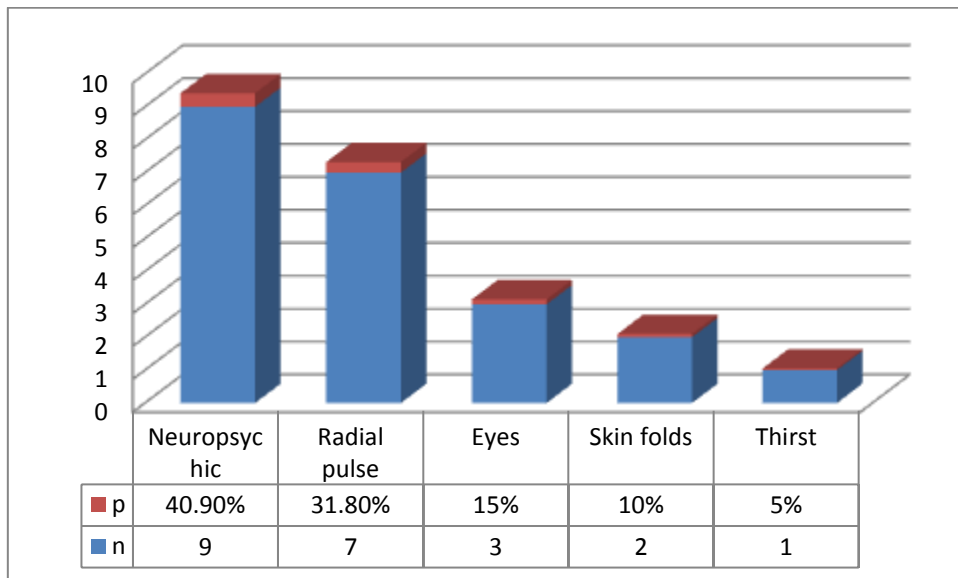
Sex		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	boy	43	55.8	55.8	55.8
	girl	34	44.2	44.2	100.0
	Total	77	100.0	100.0	



**Figure 1:** Distribution of patient according to Origin Moderate dehydration

**Table 3:** Outcomes of patients according to moderate dehydration

Dehydration (n=55)			
Variables	Elements of quotation	Numbers	Percentage
Neuropsychic	Restless	34	61.80%
	Irritable	21	38.18%
Radial pulse	Palpable	55	100%
Eyes	Hollow	40	72.72%
	Normal	15	27.27%
Skin folds	Fades slowly	55	100%
Thirst	Thirsty	42	76.36%
	Drinks greedily	13	23.63%



**Figure 2:** Outcomes of patients according to severe dehydration

**Table 4:** Distribution of the prevalence of children cases by month

		Cases			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	3.8	3.8	3.8
	April	3	3.8	3.8	7.5
	Aug	8	10.0	10.0	17.5
	Dec	12	15.0	15.0	32.5
	Feb	5	6.3	6.3	38.8
	January	11	13.8	13.8	52.5
	Jul	4	5.0	5.0	57.5
	June	3	3.8	3.8	61.3
	March	6	7.5	7.5	68.8
	May	7	8.8	8.8	77.5
	Nov	7	8.8	8.8	86.3
	Oct	3	3.8	3.8	90.0
	Sep	8	10.0	10.0	100.0
	Total	80	100.0	100.0	

**Table 5:** assessment of outcomes according to mortality

		Count		
				Total
		Dying	living	
Age	4.00	5	5	10
	5.00	4	5	9
	6.00	0	13	13
	7.00	1	28	29
	8.00	1	15	16
Total		11	66	77
sex				
boy		3	40	43
girl		8	26	34
Total		11	66	77
Origin				
Rural		8	18	26
Urban		3	48	51
Total		11	66	77

**STATISTICAL ANALYSIS**

**Table 6:** Person correlation between mortality with variables of origin

Variable	mortality	Rural	Urban
R correlation	1.00	+0.765	-0.54
s-sig	---	0.001	0.74
N		77	

**Table 7:** Person correlation between mortality with variables of sex

Variable	mortality	Boys	Girls
R correlation	1.00	-0.4	0.66*
s-sig	---	0.42	0.001
N		77	

**Table 8:** Person correlation between mortality with variables of age

Variable	mortality	Four years	Five years	Six years	Seven years	Eight years
R correlation	1.00	+0.987**	+0.75*	-0.6	-0.44	0.722
s-sig	---	0.03	0.04	0.878	0.92	0.1
N		77				

## DISCUSSION

In this study, 77 pediatric patients were collected to know the effect of rotavirus on severe acute diarrhea in Iraqi children aged 4-8 years.

In this study, the most frequent age was found to be seven years for 29 patients with 37.7%, followed by eight years for 16 patients with 20.8%, six years for 13 patients with 16.9%, and four years for ten patients with 13% as shown in Table 1.

Patients were distributed according to gender in this study, and the prevalence of children where boys were more than girls (43, 34), respectively, as shown in the table.

Children aged 4 to 8 years get patients more often, and virus infection can also be asymptomatic, and such cases are often found in newborns. Rotavirus is considered a childhood disease because the adult body is more protected. The disease may be accompanied by slight intestinal upset. The disease often persists and is completely asymptomatic.

In our study, the occurrence of vomiting, a sharp increase in temperature, diarrhea, and dehydration was found. In addition, most patients develop a runny nose and redness in the throat. [Ahmed, S. et al., 2009]

The toxins of some pathogens and some viral toxins, such as rotavirus) stimulate various receptors, such as membrane adenyl cyclase, increasing the excretion of sodium and chloride into the membrane lumen. This increased secretion leads to ingress of water and causes diarrhea which is characterized by the destruction of intestinal cells and loss of villi continuity

The risk of acute diarrhea resides almost exclusively in dehydration. Severity scores for dehydration were determined using the Ruuska-Vesikari 20-point scale, originally developed to study the effectiveness of rotavirus vaccination, which was also used to assess the severity of rotavirus infection. In a recent European study [Ahmed, S. et al., 2009; Khagayi, S. et al., 2014]. However, there is no data that allows validation of the degree in the field of individual decision making

Several studies also show that rotavirus is more associated with gastroenteritis cases requiring hospitalization, and in this study, this pattern was clearly observed, as the incidence of rotavirus in hospital patients is 7% higher than in outpatient clinics; these data will confirm the effect The severity of viral diarrhea, which means that the introduction of a vaccine will have a positive effect in our environment. [Ferdous, F. et al., 2013; Sarker, M.H.R. et al., 2014]

Analysis of the monthly percentages recorded during the year of study in a hospital showed that the disease coincides with the summer months, which can be attributed to infection caused by bacteria and parasites.

The other peak was recorded in the cooler months, where the highest rate of rotavirus infection was observed. However, it is important to note that rotavirus is also present in the summer, in the months corresponding to November (8.8%) and December (15.0%). Therefore, the importance of rotavirus as a cause of year-round gastroenteritis emerges.

## CONCLUSION

In this study, a direct relationship was found between the severity of gastroenteritis with rotavirus and the amount of fluid loss with vomiting and diarrhea and the development of dehydration, often of the second and third degree, Dry skin, Radial pulse, and Neuropsychic Restless and the duration of illness rarely exceeds 5-7 days. After a history of rotavirus gastroenteritis, the child may become re-infected due to seasonal changes in circulating rotavirus serotypes, but a history of normal infection may reduce the severity of subsequent infection.

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