

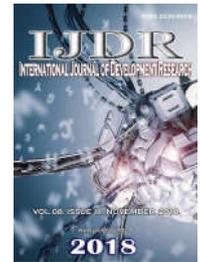


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ROLE OF BREAST FEEDING AGAINST INFECTION WITH ROTAVIRUS AMONG CHILDREN WITH ACUTE GASTROENTERITIS

^{1,*}Dr. Qasim Dawood Yasir Altameemi and ²Dr. Ansaf Abdulhussein Mahoor Chlaibawi

¹Asst. Prof. and Consultant Pediatrician in Faculty of Medicine, Wasit University, Iraq

²A Senior Gynecologist in Al-Kut Hospital for Gynecology and Pediatrics, Iraq

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ABSTRACT

A prospective study was conducted over 2 years on 4600 children aged between 2 weeks to 5 years with acute gastroenteritis who were attending the pediatric clinics of Al-Zahraa and Al-Karama Teaching Hospitals in Kut - Iraq for the period between 1st of July 2016 to 30th of June 2018 to identify the role of breast feeding against infection with rotavirus in children with acute gastroenteritis. The aim of this study is to prove the effectiveness of breast feeding as a protective tool against infection with rotavirus among young children presented with acute gastroenteritis to offer informations for the health authorities to standardize a proper guidelines for prevention and control of this disease. Fecal specimens were collected properly and tested for the presence of human rotavirus antigen by Latex Agglutination (LA) test. The rotavirus antigen was detected in 55% of fecal specimens from children with acute gastroenteritis. Human rotavirus antigen was detected more in stool of infants between 6 – 24 months of age, more in low socio-economic group and rural patients; and lowest among breast-fed infants. There was no sex predilection to get the infection with the virus.

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INTRODUCTION

Diarrhea is estimated to cause 1.5 million deaths and 21% of all under fives mortality worldwide (WHO, 2008). Rotavirus (RV) is the most common cause of severe diarrhea among infants and young children (Dennehy, 2000). RV is usually an easily managed disease of childhood, but worldwide more than 500,000 children under five years of age still die from rotavirus infection each year and almost two million more become severely ill (Simpson *et al.*, 2007). "RV is estimated to cause about 40 per cent of all hospital admissions due to diarrhea among children under five years of age worldwide leading to some 100 million episodes of acute diarrhea each year that result in 350,000 to 600,000 child deaths." (UNICEF/WHO, 2009). It is the leading single cause of severe diarrhea among infants and children, being responsible for about 20% of cases, and accounts for 50% of the cases requiring hospitalization (Simpson *et al.*, 2007). Boys are twice as likely to be admitted to hospital as girls (Rheingans *et al.*, 1990). RV is transmitted by the fecal-oral route, via

contact with contaminated hands, surfaces and objects (Butz *et al.*, 1993) and probably by the respiratory route (WHO, 2008). Dehydration is more common in rotavirus infection than in most of those caused by bacterial pathogens, and is the most common cause of death related to RV infection (Maldonado and Yolken, 1990). Milk intolerance due to lactase deficiency is a particular symptom of RV infection, which can persist for weeks (Ouweland and Vesterlund, 2003). Breastfeeding could reduce gastrointestinal infections as breast milk contains lactadherine, secretory IgA, T and B-lymphocytes, bactericidal lactoferrin, and oligosaccharides (Morrow *et al.*, 2004). However, the specific role of breastfeeding in the prevention of RV diarrhea has not been well established but it is generally considered to at least reduce the severity of the disease (Duffy *et al.*, 1986). Specific diagnosis of infection with RV-A is made by finding the virus in the child's stool by enzyme immunoassay (Smith *et al.*, 1993). Treatment of acute RV infection is nonspecific and involves management of symptoms and, most importantly, maintenance of hydration (Diggle, 2017).

Aim of the study: To verify the role of breastfeeding in protection against infection with RV in young children with acute GE.

*Corresponding author: Dr. Qasim Dawood Yasir Altameemi, Asst. Prof. and Consultant Pediatrician in Faculty of Medicine, Wasit University, Iraq.

PATIENTS AND METHODS

A prospective study was conducted over 2 years on 4600 children aged between 2 weeks to 5 years with acute GE who were attending the pediatric clinics of Al-Zahraa and Al-Karama Teaching Hospitals in Kut - Iraq for the period between 1st of July 2016 to 30th of June 2018 to identify the role of breastfeeding in protection against infection with RV in young children with acute GE. "Diarrhea" was defined as "passage of three or more loose or liquid stools in any 24-hour period (for breastfed infants, this also required a statement by the mother that the stools had become more frequent or less formed than usual for the infant)". Fecal specimens were collected properly and tested for the presence of human RV antigen by Latex Agglutination test (Rota-kit Biomerieux – France). Medical history, was recorded and physical examination was carried out for each patient. The following informations were recorded: age, sex, residence, date of admission, type of feeding, socioeconomic status and clinical presentation. Chi-square test was carried out to determine the relative importance of various variables, P value < 0.05 was considered as statistically significant and < 0.01 as highly significant.

RESULTS AND DISCUSSION

Out of 4600 children (2588 = 56.26% males and 2012 = 43.74%) females presented with acute GE, 2530 (55%) [1412 = 55.81% males and 1118 = 44.19% females] were positive for RV (Table.1).

formula fed infants presented with acute GE due to other causes. RV GE affects mainly infants and children between 6 months to 2 years (about 74%). These results are in accordance with the results of Basu (2003) who found that the majority of RV infections (91%) were observed in children less than two years of age, emphasizing the fact that RV infection occurs early in life; and this could be due to less mature immune system for these infants which can reduce their ability to mount strong immune defense against infectious agents, less chance of a previous exposure to the offending microbe so that less immune protection, and the high incidence of exposure to respiratory tract diseases especially during winter months with the concomitant risk of developing GE; while transplacental acquired immunity and exclusive or partial breastfeeding may reduce the incidence of infection with RV in the first few months of life. The prevalence of RV infection was least among infants who were breast fed (10.45%) and highest among infants on artificial formula (63.76%), while there was no significant difference between breast fed and formula fed infants presented with acute GE due to other causes. These findings are consistent with the findings of most other studies published worldwide (Clemens *et al.*, 1993) and this may be explained by the anti-infective and anti-inflammatory properties of human breast milk (Chierici, 2001). The lowest incidence of infection in infants under six months may be partially due to the protective effect of exclusive or partial breast feeding against malnutrition and malnourished children have defects in their cellular and humoral immunity (Clemens *et al.*, 1993) so they are more liable to have prolonged diarrhea and more liable to become chronically infected with RV.

Table. 1. Epidemiological distribution of the studied population

Variable	Patients with R.V. +ve GE		Patients with -ve R.V. GE		Total	p- value	
	No. 2530	% 55	No.2070	% 45		No. 4600	% 100
Age (months)							
< 6	179	7.07	233	11.26	412	8.96	< 0.01
6 – 12	1190	47.04	370	17.87	1560	33.91	
13 – 24	659	26.05	346	16.71	1005	21.85	
25 – 36	165	6.52	510	24.64	675	14.67	
37 – 48	160	6.32	392	18.94	552	12	
49 – 60	177	7	219	10.58	396	8.61	
Sex							
Male	1412	55.81	1176	56.81	2588	56.26	> 0.4
Female	1118	44.19	894	43.19	2012	43.74	
Feeding	2028	80.15	949	45.84	2977	64.72 (1 st 2 years)	
Breast	212	10.45	251	26.45	463	10.06	< 0.01
Artificial	1293	63.76	498	52.48	1791	38.93	
Mixed	523	25.79	200	21.07	723	15.72	

There was no sex preference to get the infection with the virus. RV GE affects mainly infants between 6 – 12 months (47.04%) and children between 13 – 24 months (26.05%). The high prevalence of RV positive cases (55%) among children with acute GE in our study proves that rotavirus is a major aetiological agents for acute diarrheal diseases in young children and a leading cause for morbidity and hospitalization with the consequent burden on health and the community. These findings were consistent with the findings in Brazil (Teixeira *et al.*, 1998) where group A- RV detected in stools of up to 69% of children with diarrhea seen at emergency rooms, depending on the season. In Basrah, Iraq (Abbas *et al.*, 2000), The percentage of RV infection among children with acute watery diarrhea was 43.3%. The prevalence of RV infection was least among infants who were breast fed (10.45%) and highest among infants on artificial formula (63.76%), while there was no significant difference between breast fed and

In rural Egypt, they conclude that early initiation of breastfeeding was associated with a marked reduction of the rate of diarrhea throughout the first 6 months of life, possibly because of the salutary effects of human colostrums(18). On the contrary, a study in Basrah, Iraq (Abbas *et al.*, 2000) and in Uganda(19); did not support these findings and they explained that the infection with RV may be rarely associated with significant increase in anti-RV IgA titer in breast milk.

Conclusion and recommendation

- Breast feeding during the first two years of life plays an important protective role against infection with rotavirus, although the practice of breast feeding is decreasing in the community.
- Doctors, especially juniors and residents; should have a high index of suspicion of RV infection in any young

child presented with acute GE especially infants on artificial formula.

- A great work is needed from the health care professionals to educate pregnant ladies and lactating mothers about the great benefits of absolute breastfeeding especially during the first six months of life as a main immuno-protective method against serious diseases including GE and malnutrition, health professionals must understand the skills necessary for the management of breastfeeding, in order that mothers are given proper advice on how to breastfeed and how to deal with problems that may arise.

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