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Research article

Role of rotavirus as the cause of acute pediatric diarrhea in Al-Diwaniyah, Iraq

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Abstract

Rotavirus illness is associated with significant rate of morbidity and is a common cause of hospitalization worldwide. This study was performed to evaluate the role of rotavirus in children presenting with acute diarrhea in maternity and pediatrics hospital in Al-Diwaniyah during the period from March 2007 to February 2008. Stool specimens from 600 children (between 2 months and 5 years of age), 380 were males and 220 were females, suffering from diarrhea were tested for the antibodies against rotavirus by use of latex agglutination card test. The antibodies of rotavirus were detected in 240 (40%) of stool samples that 150 (62.5%) in males and 90 (37.5%) in females. The affected age of 210 patients (87.5%) were in 5 months to 5 years whereas 30 patients (12.5%) were below 5 months. According to the living areas, 140 patients (58.33%) were from urban areas while 100 patients (41.67%) were from rural areas. According to the type of feed, 136 patients (56.67%) were artificially fed, 36 patients (15%) were breastfed and 68 patients (28.33%) were of mixed feeding. It can be concluded that rotavirus infection was significantly less frequent in breast-fed than among bottle-fed babies.

Keywords: Children, Diarrhea, Gastroenteritis, Rotavirus

Introduction

Rotaviruses are one of the major causative agents of gastroenteritis accompanied by diarrhea in infants and young children. It has been estimated that more than 600,000 deaths occur in children under the age of below 5 years due to rotavirus infection, especially in developing countries (22, 24). As a significant health problem, diarrhea in the developing and developed countries is probably the main cause of childhood mortality in the world, where it account about 5-10 million deaths per a year (23, 29). Epidemiologically, diarrhea is considered as the common infection of winter season which may affect adults by direct contact with infected infants particularly in the endemic areas. The most common age of children which are affected by diarrhea is 6 months to 2 years especially those under breast-fed (18, 19, 22). Fecal-oral and sometimes nosocomial routs are the main ways of infection especially in overcrowded areas. About 10% of infants infected with rotaviruses may simultaneously infected with other GI pathogens such as *Salmonella*, *Shigella* or *E-coli* species (5, 15, 29). Furthermore, it has been mentioned that rotavirus infection may accompanied by secondary disaccharidase deficiency (11). Although most of the knowledge regarding rotavirus infections in infants were based on hospital-centered studies, there is an inherent referral bias may be in consideration [(29)]. Human rotavirus (HRV) is considered as one of the main cause of severe gastroenteritis in infants and young children (15, 17), where some times, HRV infection is nosocomial acquired and characterized as an asymptomatic (8, 19, 30). Although rotavirus Infection may cause disaccharides deficiency (21). The major pathogenic mechanism may be through decreased water and salts absorption due to the damage of gastro-intestinal cellular microvilli. Clinically, it has

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been noted that rotavirus gastroenteritis is accompanied by vomiting, profuse watery diarrhea contains no blood or mucous and fever. In addition the baby may denotes rhinitis, congested drums and pharynx. Dehydration may be mild, moderate or severe (27). The clinical signs could be extended for 3-9 days after that diarrhea may be spontaneously recovered, but still fluid therapy is necessary for treatment of dehydration (7, 9). No specific antiviral agent can be advised for treatment, but there is a rotavirus vaccine could give promising results in preventing the infection as well as the good hand washing and sanitation (6, 12)

Materials And Methods

Ethical approval

The Ethical Committee of Medicine College, University of Al-Qadisiyah, Iraq, has approved the present study.

The present study was carried out at the maternity and pediatrics hospital (MPH) in Al-Diwaniyah over a period of 12 months extending from March 2007 to February 2008. Six hundreds child and infant between 2 months and 5 years of age with gastroenteritis diarrhea were included in the study. Bloody gastroenteritis cases were excluded from the study. The data of consideration in the present study were age, sex, address and type of feeding in addition to the degree of dehydration and state of nutrition which are assessed during examination. Fecal samples were collected from children in the neonatal period, and a baseline assessment of the domestic environment was conducted by interview. All stool samples were transported in ice to the laboratory and were processed immediately for the detection of rotavirus. Microscopic examination was performed for each stool sample looking for any abnormality as well as parasites. Stool samples were also sent for rotavirus utilizing the slidex rota kit 2 which is monoclonal antibody sensitized latex reagent for the detection of antibodies in the stool (latex agglutination card test) by Biomerieux –France.

Results

Rotaviruses were detected in 240 out of 600 stool samples (40%), where 62.5% in males and 37.5% in females (table 1). The results also showed that 210 patients (87.5%) were above 5 months while 30 cases (12.5%) were below 5 months (table 2). In regard to the type of living, the results recorded that 140 patients (58.33%) were living in urban areas while 100 patients (41.67%) were from rural areas (table 3). Table (4) showed that rotavirus infection was significantly less frequent in breast-fed (15%) than bottle-fed babies (56.5%) and mixed fed (28.5%). On the other hand, it has been found that, rotavirus infection was detected in association with either diarrheagenic *Escherichia coli* or Shigella spp. The most frequent combinations were rotavirus-enter aggregative *E. coli* and rotavirus-enteropathogenic *E. coli*.

Table (1): The incidence of rotavirus according to sex.

Males			Females			Total		
No. tested	HRV		No. tested	HRV		No. tested	HRV	
	N0.	%		No.	%		No.	%
380	150	62.5	220	90	37.5	600	240	40

Table (2): The incidence of rotavirus according to age.

Age	below5 Months	5mons.-5years	Total
No.	30	210	240
%	12.5	87.5	100

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Table (3): The incidence of rotavirus according to the living area.

	Urban area	Rural area	Total
No.	140	100	240
%	58.33	41.67	100

Table (4): The incidence of rotavirus according to the type of feeding.

Feeding	**Breast**	**A artificial**	**mixed**
No.	**36**	**136**	**68**
%	**15**	**56.67**	**28.33**

Discussion

Rotavirus infection of gastroenteritis is a major cause of childhood diarrhea throughout the world and its incidence is more than 40%. Our results recorded the incidence of 40% which was in agreement with other studies, where it has been reported in Kuwait (42%). except one research done in Calcutta (7, 24) in which the result recorded (23%-24%), and in Baghdad in which it was (24%). In Irbed, Jordan (35%). in Argentina (46.5%) in Vietnam was (46.7%), in Taiwan was (57%). prevalence was significantly higher (62%) in children aged less than 24 months in other study in Hanoi, Vietnam. In comparison with other studies which have been performed in Baghdad (24), we found that the incidence in Al-Diwaniyah was (40%) while it is (24%) in Baghdad, this difference may be related to the level of socioeconomic status as well as the type of living and water purity (24). Within the diarrhea group, the highest incidence was seen in children from 5 to 24 months of age, and was higher in males than in females. This variations could be explained by the liability for infections is sex linked inherited (21) which put the male at more risk of infection including rotavirus gastroenteritis. (1, 21). The most common age affected by rotavirus infection was found between *5* months -5years (6, 9). This fact is also proved in our study in which more than 87.7% of the cases were in this age while less than 12.5% were below *5* months. This result could be attributed to the high immunity of those below 5 months against rotavirus transmitted through placenta in addition to the immunity gained by the breast milk (9).The present result was in agreement of others, where proved that the risk factors for acute diarrhea in children are related to the infant feeding rotavirus gastroenteritis is less common-in breast-fed babies that those artificially fed (4, 9). In breast-fed babies that those artificially fed (11) we think that this is because that breast milk is fully sterilized in addition to that it contains antibodies against different types of pathogens including rotavirus decreasing the severity of the infection (13, 19, 24).

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