

ROTAVIRUS ENTERITIS IN INFANTS, CLINICAL AND THERAPEUTICAL ASPECT

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Abstract

The following study aims are to establish the incidence of the rotavirus enteritis in infants, clinical manifestation and the main therapeutic measures in the Pediatric Department of Constanta County Emergency Hospital over a period of two years, on a group of 166 infants diagnosed with rotavirus acute enterocolitis. The incidence of rotavirus acute enterocolitis is significant in our study- 38% of cases hospitalized for acute diarrheal disease. In 8,7% of patients we found associations between rotavirus and adenovirus. The peak incidence was recorded in the winter months (71 cases - 42.7%). All infants had watery diarrhea and the most frequently signs and symptoms were: vomiting (76.5%), fever (47.5%) and anorexia (42.1). The hospital treatment has made rebalancing hydroelectrolytic predominantly orally (66%). Evolution was good for all infants studied. Only 14 infants (9%) of the study were vaccinated against rotavirus. It is important to introduce rotavirus vaccine in infants as a prophylactic measure.

Key words: acute enterocolitis, rotavirus, infants.

Introduction

Rotavirus infections are the most common cause of severe diarrhea in infants and children worldwide. The incidence of rotavirus worldwide is estimated to cause more than 125 million cases of infantile diarrhea annually [1,2]. Rotavirus is the foremost cause of childhood dehydrating gastroenteritis worldwide [2,3]. Symptoms of rotavirus infection include the following: anorexia, low-grade fever, watery, bloodless diarrhea, vomiting and abdominal cramps. Before the introduction of the newer rotavirus vaccines, rotavirus was estimated to cause 20-60 deaths annually in the United States in children younger than 5 years [4].

A significant proportion (20-40%) of infections are asymptomatic, which contributes to the spread of the virus and might reduce the efficiency of prevention measures given as they are implemented too late. Throughout most of the world, rotavirus is present all the year round, which suggests that low-level transmission could maintain the chain of infection. Prevention of RV infection by mass vaccination could have a positive impact on the incidence of NRV by reducing the number of children hospitalized for gastroenteritis, therefore reducing the number of hospital cross-infections and associated costs. Vaccines also

contribute to reducing resource utilisation by preventing nosocomial infections, such as rotavirus gastroenteritis, which can increase hospital stays by 4-12 days [5,6,7].

Aims of the study

In this study we aimed to analyze the following data: incidence of rotavirus infection in the admissions at Pediatric Clinic Emergency Hospital Constanta, the main clinical manifestations, dehydration degree, study of acid-base and electrolyte balance in cases of dehydration; the main therapeutic measures and evolution, status of vaccination against rotavirus.

Material and methods

The trial was conducted on a total of 166 patients aged in the range of 0-1, admitted to the Pediatric Clinic Emergency Hospital Constanta with a diagnosis of acute enterocolitis immunochromatographic rapid test for rotavirus by viral etiology. The study was conducted between 1 January 2011 – 31 December 2013.

Patients studied were performed by an observation sheet where noted: age, sex, food type (natural-artificial-mixed), area of origin, education level of the mother and condition of life, reason and period of admission, previous medical history, general physical examination, treatment and evolution.

Results and discussions

Rotavirus infection accounted for 35% of cases hospitalized for acute diarrheal disease. Rotavirus was isolated from 166 patients (35%) of 412 cases. The remaining cases had another cause: viral - adenovirus (20 %); bacterial: Klebsiella (10 %), E. Coli (7,2 %), Staph. Aureus (4 %). Noted that 26.9% were cases undiagnosed or other etiology. Rotavirus was the highest percentage of cases hospitalized for diarrhea.

76 studies from 16 countries were identified and the mean percentage of acute gastroenteritis (AGE) cases caused by rotavirus ranged from 25.3%-63.5% in children < 5 years of age, peaking during winter [8]. In Japan, from January 2001 through December 2002, a total of 443 children < 5 years of age were hospitalized for acute gastroenteritis. Of 422 stool specimens collected, 244 (58%) tested positive for rotavirus [9].

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From the group of 166 infants diagnosed with rotavirus enterocolitis, 91 were male and 77 were female.

76 (46%) were from urban areas and 90 (54%) children come from rural areas.

Distribution of cases according to season and month: in our study the majority of rotavirus disease occurred in winter (42.7%) with a peak in February (32 cases), confirming the literature noted. In the temperate zone rotavirus infections is a winter disease while peaks in the autumn or spring are common in other parts of the world. In America the study found that their incidence peaked was in winter primarily [10,11].

During the year were diagnosed sporadic cases (Spring - 31.3% Autumn - 18.6% in the Summer - 7.2%). The most frequent causes of Rotavirus infections appeared in December (25), January(14) and February(32).

Distribution by age shows that rotavirus diarrhea incidence was highest in infants in the age group 3-6 Month(42%) (Figure 1).

The age of 3 month is low immunity (receive transplental antoibody level decreased, while its antibodies are just begining to form); between 3 to 6 month, most infants begin to be feed artificially or mixed; early and improper diversification favors the appearance of acute diarrheal disease and dehydration default.

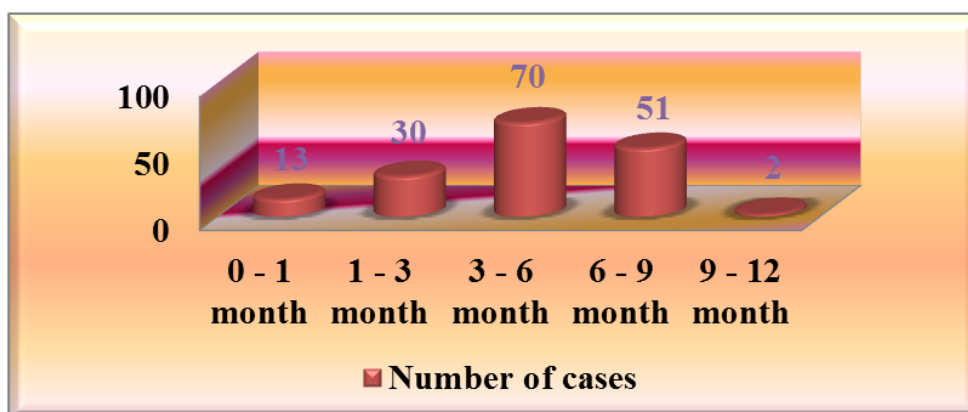


Figure 1. Patients distribution by age group.

Distribution of cases according tp type of feeding: from the 166 infants with rotavirus infection diagnosed by us, 36 infants were brest feeding, 21 infants mixed feed, artificial feed only 9 and majority – 80 infants with diversified feeded.

Distribution of cases according to education level of mother : 25 were illiterate (15,6%), 16 finished four classes (9,6%), 47 finished 8th grade middle school (28,3%), 60 (36,1%) complete high school and 18 (10,8%) finished college.

Nutritional Status of Patients: most infants, 95 in number, were normal weight (57%), the rest being underweight and divide thus:

- 48 infant (29 %) with dystrophy de grade I ;
- 18 infant (11 %) with dystrophy de grade II ;
- 6 infant (3 %) with dystrophy de grade III.

Early symptoms in the group of infants studied were : diarrhea, watery stools in all patients, vomiting in 127 patients and fever in 79 patients. There were no reported bloody stools (table 1).

Table 1 Clinical Manifestation of Patients.

Symptom	Number of Case	Percentage %
Diarrea	166	% 100
Vomiting	127	76.5%
Fever	79	47.5%
Anorexia	70	42.1%
Full Skin inactivity	47	28.3%
Sunken Eyes	31	18.6%
Oliguria	6	3.6%
Extremely marbled	6	3.6%
Cough and Coryza	28	16.8%

Maculopapular rash

1

0.6%

90 patients who had signs of dehydration were divided as follows:

- 42 cases (0.4%) with slight dehydration of approximately 5% loss of liquid;
- 40 cases (0.5%) with an average drying loss of around 8% liquid;
- 8 patients (0.1%) had severe dehydration with loss of > 10% liquid;

Distribution of cases according to result of ionogram : imposed performance ionogram in 60 of the patients and found:

Serum Na :

- 39 cases had hyponatremia (<120 mEq/l);
- 17 cases had normal serum sodium levels (120 – 135 mEq/l);
- 4 cases had hypernatremia (>150 mEq/l).

Serum K:

- 43 cases had normal potassium level (3,5 – 5,5 mEq/l);
- 12 cases had hypokalemia (< 3,5 mEq/l);
- 5 cases presented hyperkalemia (> 5,5 mEq/l).

Balance of Acid-Base - metabolic acidosis is excessive loss of base expression and increased fluid loss through vomiting and diarrhea. Thus alkaline reserve was determined at 60 patients of which 40 (66%) had low values and the remaining 20 patients (34%) were within normal limits.

Therapy for children with acute diarrhea rotavirus in our study was determined by the degree of dehydration. They received oral re-hydration 110 children (66%) and the remaining 56 children (34%) received parenteral rehydration hydro and acid-base rebalancing.

From the 166 patient severe forms of dehydration syndrome has number of 98 cases treated with antibiotics was established from the beginning (regarding a possible infection enteral and / or parenteral) to obtain the result of FOBT (Fecal Occult Blood Test). The antibiotics used were ampicillin in combination with gentamicin or generation cephalosporin-III (ceftriaxone).

The most frequently prescribed were: ampicillin, ampicillin + gentamicin association, cephalosporin and cephalosporin + gentamicin (table 2).

Table 2. Distribution by antibiotics used.

Antibiotics used	Number of treated cases
Ampicillin	48
Gentamicin	22
Cephalosporin	28

Duration of hospitalization infectious diarrheal episode was divided as follows:

- 56 infants (34%) hospitalized from 3 -7 days
- 98 infants (59%) hospitalized between 8-12 days
- 12 infants (7%) hospitalized between 12 to 16 days.

Vaccination of Rotavirus infections: From the 166 infants diagnosed with Rotavirus Acute Enterocolitis only 14 of them (9%) were vaccinated and the remaining 152 patients (91%) were not vaccinated.

Conclusions

In our study rotavirus was the most common cause of acute diarrhea in children.(38%) of cases hospitalized for acute diarrheal disease.Were notice rotavirus and adenovirus associations to 8.7% of patients.

The peak incidence was recorded in the winter months (71 cases - 42.7%) with a peak in February (32 cases - 20.5%). The gender distribution was approximately uniform: 54% - male, 46% - female. Rotavirus diarrhea incidence is highest in the age group between 3-6 Month (70 cases - 42%).

Infants which feeding naturally showed a lower incidence cause of rotavirus infection (25%).

Data analysis indicates that the low level of education of the mother is a contributory factor for the occurrence of acute rotavirus enterocolitis.

All infants had watery diarrhea and hospitalization of the signs and symptoms most frequently encountered were: vomiting (76.5%), fever (47.5%) and anorexia (42.1%). Note that no patient had bloody stools.

From the 90 patients who had signs of dehydration, 42 cases (0.4%) had slight dehydration degree of 40 cases (0.5%) dewatering the medium and only 8 patients (0.1%) developed severe dehydration requiring parenteral rebalancing.

In moderate to severe dehydration forms were recorded electrolyte and acid-base disorders: hyponatremia (65%), hypernatremia (7%), hypokalemia (20%), hyperkalemia (9%) and metabolic acidosis in 66% of cases.

Mostly infants not receiving outpatient treatment (50%), only some were treated with antibiotics (22.8%), anti-diarrheal (19.2%) and very few attempted treatment by diet (8.4%). The hospital has made rebalancing hydroelectrolytic predominantly orally (66%).

Duration of infectious diarrheal episode was most of the time on average, between 8-12 days (59%). Evolution was good for all infants studied.

Only 14 infants (9%) of the study were vaccinated against rotavirus. The large number of rotavirus disease virus makes this a public health problem that requires the

introduction of rotavirus vaccine in infants as a prophylactic measure.

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