“OVIDIUS” UNIVERSITY OF CONSTANTA

DOCTORAL SCHOOL OF MEDICINE

MEDICINE PH.D. FIELD

ACUTE GASTROENTERITIS WITH ROTAVIRUS AT CHILD

PH.D. THESIS ABSTRACT

Scientific coordinator:

Prof.univ.Dr. Sorin Rugină

Doctoral student:

Simona Răceală (Diaconu)

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In the general part of the thesis are reviewed the data from literature on rotavirus infection. Recent data on epidemiology, pathogenesis, diagnosis and therapeutic options are presented.

In the special part, a descriptive, observational, prospective and retrospective study was carried out on patients admitted to the 1st Department of Infectious Diseases Hospital, Constanta, in 2011-2012, with the diagnosis of acute rotavirus gastroenteritis.

Acute infectious diarrheal diseases are commonly found in human pathology worldwide. For children, diarrheal diseases rank first. With high morbidity and mortality, acute diarrheal diseases are a major public health problem. It is estimated that 3-5 billion cases of acute diarrheal diseases with 5-10 million deaths occur globally. Acute diarrheal diseases are closely related to the socio-economic level of a population, with the degree of community sanitation, hygiene and food habits, personal hygiene, and climatic conditions.Viral gastroenterocollites account for a significant proportion (30-40%) of these.

Rotavirus is the most common etiology of diarrheal disease in infants and young children (1). By the age of 5, almost every child in the world has been infected with this virus at least once. (2, 3, 4) Rotavirus gastroenteritis is the most common cause of gastroenteritis in children worldwide, responsible for a third of cases of acute diarrhea globally per year (5). Community infections have increased prevalence in the age group of 6-23 months, and nosocomial infections have increased prevalence under the age of 5 months. Rotavirus is involved in 31-87% of pediatric cases of nosocomial diarrhea (6). On average 21% of hospitalized rotavirus gastroenteritis are nosocomial infections (7). Nosocomial infections prolong the duration of hospitalization by 4-12 days, leading to increased medical costs (8). Nosocomial infections are mainly associated with low age, usually in winter, in many countries, coinciding with the seasonal peak of other viral infections (9). Rotavirus is the most common etiology of diarrheal disease in infants and young children (1). By the age of 5, almost every child in the world has been infected with this virus at least once (2, 3, 4). Rotavirus gastroenteritis is the most common cause of gastroenteritis in children worldwide, responsible for one third of all cases of acute diarrhea globally annualy (5).

Community infections have increased prevalence in the age group of 6-23 months, and nosocomial infections have increased prevalence under the age of 5 months. Rotavirus is involved in 31-87% of pediatric cases of nosocomial diarrhea (6). On average 21% of hospitalized rotavirus gastroenteritis are nosocomial infections (7). Nosocomial infections

prolong the duration of hospitalization by 4-12 days, leading to increased medical costs (8). Nosocomial infections are mainly associated with younger age, usually in winter, in most countries, coinciding with the seasonal peak of other viral infections (9). Type A rotavirus, responsible for 90% of human infections, is endemic in the world (10). The lower the age, the higher the risk of severe illness. After 5 years of age, symptomatic disease (11) appears to be less common. There is common intra-family spread from various institutions. There are groups at risk: nursery or other nursing children, hospitalized children (nosocomial infections), children and adults with immunodeficiency, nursing staff in hospitals (12). Boys are twice as likely to be hospitalized due to rotavirus disease than girls (13, 14).

Rotavirus belongs to the family Reoviridae, the Sedoreovirinae subfamily (ICTV-Taxonomy). There are eight types of rotavirus, listed from A to H. (15) Types A, B, C, but especially Type A, give human infections. (16) There are different strains called serotypes in Type A. (17) In serotype A, depending on the external capsid proteins, serotypes P (VP4 protein) and serotypes G (depending on VP7 protein) are described. Up to now, 20 serotypes P and 14 G serotypes have been identified, of which pathogens for humans are: P4, P6, P8, P9 and G1-G4.

In Romania, a multicenter study was carried out, as a result of which the circulating genotypes appeared in the community: G9P [8] (34.27%), G4P [8] (25.83%), G1P [8] %). (18).Nosocomial infections were reported by genotypes G9P [8] (34.58%), G1P [8] (17.76%), G4P [8] (15.89%). G9P [8] has been shown to be the most prevalent genotype in hospitals, and G4P [8] is the most prevalent genotype for non-survivors. G2 traffic was low (7.67%), similar to other European countries (19). Distribution is comparable to other countries in Central and Eastern Europe (19, 20).

The most common complications of gastroenteritis produced by Rotavirus are dehydration, hydro-electrolyte disturbances. The rotavirus infection produces aqueous diarrhea, which rarely presents mucus or blood.

In the Pediatric department of Clinical Hospital of Infectious Diseases Constanta were confirmed 333 cases in 2011, 172 cases in 2012, 111 cases in 2013, 126 cases in 2014, 306 in 2015, 176 in 2016, 211 in the first 7 months of the year 2017.

This study aims to evaluate the impact of Rotavirus on the digestive pathology of the child. The main objective is the complex analysis of all cases of rotavirus infection requiring hospitalization, aiming at:

- epidemiological data (age, gender, background);

- the number of days of hospitalization;

- Diarrhea characteristics (maximum number of chairs per day), the presence of vomiting, and the maximum number of vomits per day;

-the presence of fever;

-dehydration degree (based on the definition of acute dehydration clinical syndrome: 5%, 5-10%, over 10%);

- the presence of toxic condition, lethargy (apathy, drowsiness, change of vital functions);

Paraclinical data: Hb (g / dL), leucocyte count / mmc, fibrinogen (mg%), VSH (mm / h);

-correlation between the factors favoring the evolution of the disease;

- comparisons between batches of cases with rotavirus infection and cases of diarrheal diseases of other aetiologies;

- characteristics of nosocomial infection;

- assessing the need for vaccination.

The patient's medical records and the hospital's electronic database were used in the study.Objectives of this study were:

-Observing the peculiarities of rotavirus infection in children hospitalized in the Clinical Hospital of Infectious Diseases Constanta in the period 1st January 2011 - 31st December 2012;

-The epidemiological aspects of infection with rotavirus;

-Evaluation of clinical and laboratory aspects of this infection and compare with clinical and laboratory aspects of acute diarrheal disease with other triggers;

-Observing the evolution of rotavirus infection;

-To assess the need for vaccination.

This study aims to observe the peculiarities of acute rotavirus infection in children. The main objective is to define the typical average of cases of rotavirus infection requiring hospitalization.

-epidemiological data

-clinical, paraclinical and evolutionary data of acute rotavirus gastroenteritis;

- correlations among the factors favoring the evolution of the disease

- comparisons between batches of positive rotavirus cases and negative rotavirus

- features of nosocomial infection

- assessing the need for vaccination.

Material and Methods:

It has been realized a descriptive, observational, non-interventional, prospective and retrospective study, performed on patients with acute diarrheal disease hospitalized in the pediatric ward of the Infectious Diseases Hospital Constanta over a period of two years (2011-2012).

It is a prospective and retrospective study in which we included patients admitted to the first section of the Children's Hospital of Clinical Infectious Diseases Constanta from 1 January 2011 until 31 December 2012, diagnosed with acute rotavirus infection.

Inclusion criteria:

-hospitalization in our department with diagnosis of acute diarrheal disease;

-confirmation of the diagnosis by the presence of specific rotavirus antigen in freshly collected faeces by a latex agglutination test (Plasmatec Laboratory) -test with a sensitivity of 97.2% and a specificity of 97.1%.

-for comparison-coprocultures.

Hematological parameters were determined in the hospital's hematology laboratory, and microbiology samples were analyzed in the hospital's microbiology laboratory.

Parameters:

- Age: Important variable; any child is considered to be exposed to rotavirus up to the age of 5 years;

-sex;

- the source of origin;

- hospitalization;

-the presence of fever;

- number of diarrheic stools per day

-the presence of vomiting, their number;

- dehydration grade;

- the presence of toxic condition;

-associated diseases;

-paraclinic data: Hb, WBC/ mmc, fibrinogen,ESR;

- nosocomial infection.

We conducted an observational, retrospective study that included children hospitalized in the Clinical Hospital of Infectious Diseases Constanța between 2011-2012.

Methods of statistical analysis:

The descriptive analysis was conducted as it follows.

The quantitative variables were presented by value (N), average, minimum and maximum values.

The qualitative variables were presented by frequency of distribution and percentage. For comparison of qualitative variables, the Fischer or Chi-Square test was used. For the quantitative variables the t-Student test was used for two groups. It was considered statistically significant $p < \alpha = 0.05$. The t test for independent samples is used to test the difference between the averages of the same variable measured on two groups of different subjects.

SPSS returns the test result to two tables. The first "Group Statistics" table contains the number of subjects in each batch studied (N), the mean value (Mean) of the analyzed variable corresponding to each batch together with the standard Deviation and the standard error of the mean (Std Error Mean). The Independent Samples Test table presents the results of the test t as follows: Calculated value of the Leven test (F) with the associated probability p (Sig.), Calculated value of the test t (t), degrees of freedom (df) 2-tailed, Mean, Standard Deviation, 95% Confidence Interval of Difference with Lower, and Upper Limit, . If p (Sig.) <0.05 then it is considered that there is a significant difference between the averages of the groups considered; if p (Sig.)> 0.05 then it is considered that there is no significant difference between the averages of the groups considered.

For comparison of two or more groups, the ANOVA test, the Levene test to verify the homogeneity of variables was used, and then, to know which values differ from each other,

the multiple comparison test between the variables and the Bonferoni test for homogeneous dispersions and the Tamhane test for non-homogeneous dispersions. Single Way Analysis (ANOVA) is a procedure for testing the differences between environments when they are more than two and are calculated on groups of different subjects.

Results and interpretation:

- The "Descriptive statistics" table presents the descriptive indicators of the dependent variable for the analyzed groups
- The "Test of Homogeneity of Variance" table contains the Levene test result. Since the null hypothesis for the Levene test is that the dispersions are homogeneous, dispersions will be considered inhomogeneous if the value of p (Sig.) Is less than or equal to 0.05.
- The "ANOVA" table contains the test result F:
- if p (Sig.)> 0.05 the assumption is that the sample sizes are equal, and
- if p (Sig.) <0.05 it is assumed that at least two environments are different from one another.
- The "Post Hoc Tests - Multiple Comparisons" table shows the group average comparisons, taken two by two. If the Levene test confirmed the homogeneity of the variance, read the values for the Bonferoni test, otherwise the Tamhane test would have been read.

A database was created in Excel and SPPS var 17.0. The characteristics of the batches were described and the factors influencing the evolution of the disease were compared.

Ethic committee agreement of Clinical Infectious Diseases Hospital was obtained in order to publish patient's data in scientific point of view.

The general characteristics of both groups rotaviral and nonrotaviral are presented in table no. 1 and table no. 2

The general characteristics for patients with rotaviral diseases were as we can see in table I.

Table I-General characteristic of patients with Rotavirus gastroenteritis

Variable	
Age(years), [average, (min-max)]	2.54; (4months, 11years)
0-1year [N, (%)]	8; 1.58
1-2 years [N, (%)]	229; 45.3
2-3 years [N, (%)]	85; 16.83
3-4 years [N, (%)]	66; 13.06
4-5 years [N, (%)]	49; 9.7
5-11 years [N, (%)]	68; 13.47

SexM [N, (%)]	272; 53.9
SexF [N, (%)]	233; 46.1
Urban environment [N, (%)]	365; 72.3
Rural environment [N, (%)]	140; 27.7
Hospitalization December-February[N, (%)]	94; 18.6
Hospitalization March-May[N, (%)]	206; 40.8
Hospitalization June-August[N, (%)]	128; 25.3
Hospitalization September-December[N, (%)]	77; 15.2
Fever-yes [N, (%)]	480; 95
Fever-no [N, (%)]	25;5
Maximum temperature(Celsius degrees)[average; (min-max)]	37.975; (37.5-39.3)
Stools/day [average; (min-max)]	5.11; 3-10
3-6 stools/day [N, (%)]	355; 70.3
>6 stools/day [N, (%)]	150; 29.7
Vomiting-yes [N, (%)]	404; 80
Vomiting-no [N, (%)]	101; 20
Maximum number of vomiting/day	7
<3 vomiting/day [N, (%)]	480; 95
4-7 vomiting/day [N, (%)]	25;5
Vomiting/day [average]	1.487
Toxicity –yes [N, (%)]	149; 29.5
Toxicity -no [N, (%)]	356; 70.5
Nosocomial infection-yes [N, (%)]	98; 19.4
Nosocomial infection -no [N, (%)]	407; 80.6
Degree of dehydration I [N, (%)]	352; 69.7
Degree of dehydration II [N, (%)]	146; 28.9
Degree of dehydration III [N, (%)]	7; 1.4
Days of hospitalization [average; (min-max)]	6.84; (1-21)
Hb(g/dL) [average; (min-max)]	10.73; (6,6-14)
WBC/mmc[average; (min-max)]	8640.59; (2400-20700)
Fibrinogen (mg%)[average; (min-max)]	365.86; (260-710)
ESR (mm/h) [average; (min-max)]	11.45; (4-40)
Association with respiratory diseases [N, (%)]	160; 31.7
Association with digestive diseases [N, (%)]	52; 11
Association with eruptive diseases [N, (%)]	11; 2.2

The general characteristics for group 2 of patients with nonrotaviral diseases were as we can see in table II.

Table II– General characteristics of patients without rotavirus infection

Variable	
Age (years)[average; (min-max)]	4.34; (2;11)
Sex M [N; (%)]	52; 52
Sex F [N; (%)]	48; 48
Urban environment [N; (%)]	77; 77
Rural environment [N; (%)]	23; 23
Hospitalization December-February [N; (%)]	26; 26

Hospitalization March-May [N; (%)]	25;25
Hospitalization June-August [N; (%)]	37;37
Hospitalization September-December [N; (%)]	12;12
Fever-yes [N; (%)]	86;86
Fever-no [N; (%)]	14;14
Maximum temperature(Celsius degrees) [average; (min-max)]	37.8; (37.5-38.8)
Vomiting-yes [N; (%)]	40; 40
Maximum number of vomiting/day	4
<3 vomiting/day [N; (%)]	98; 98
4 vomiting/day [N; (%)]	2;2
Diarrheic stools/day [average; (min-max)]	4.2; (3-6)
3-5 Diarrheic stools/day [[N; (%)]	98; 98
6 Diarrheic stools/day [[N; (%)]	2;2
Toxicity-yes [N; (%)]	19; 19
Toxicity -no [N; (%)]	81;81
Degree of dehydration I [N; (%)]	71;71
Degree of dehydration II [N; (%)]	29;29
Days of hospitalization[average; (min-max)]	5.96; (2-15)
Hb (g/dL) [average; (min-max)]	10.56; (7,4-13,7)
WBC/mmc[average; (min-max)]	9679; (3100-18300)
Fibrinogen(mg%)[average; (min-max)]	403.41; (212-696)
ESR (mm/h) [average; (min-max)]	15.37; 4-37

Figure Age groups in the positive group

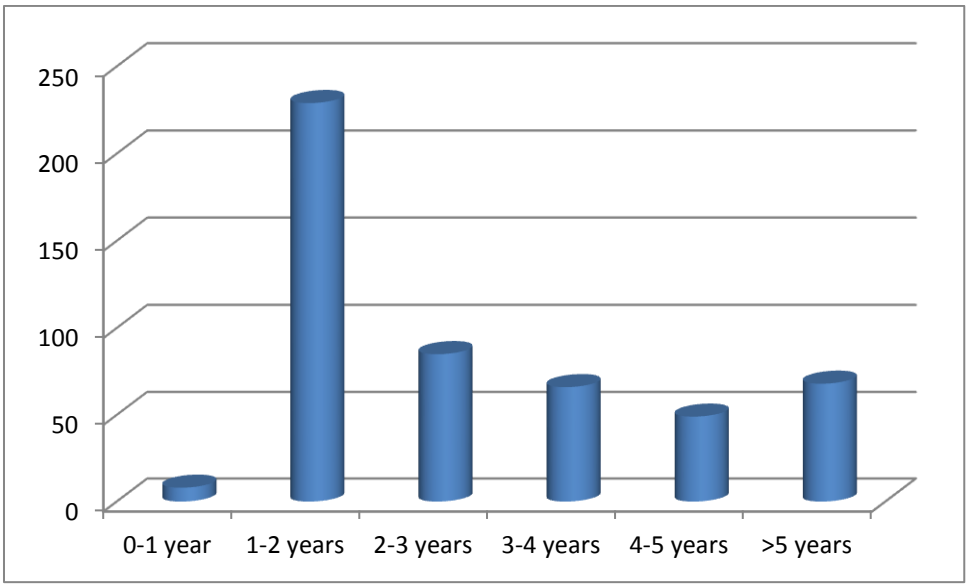
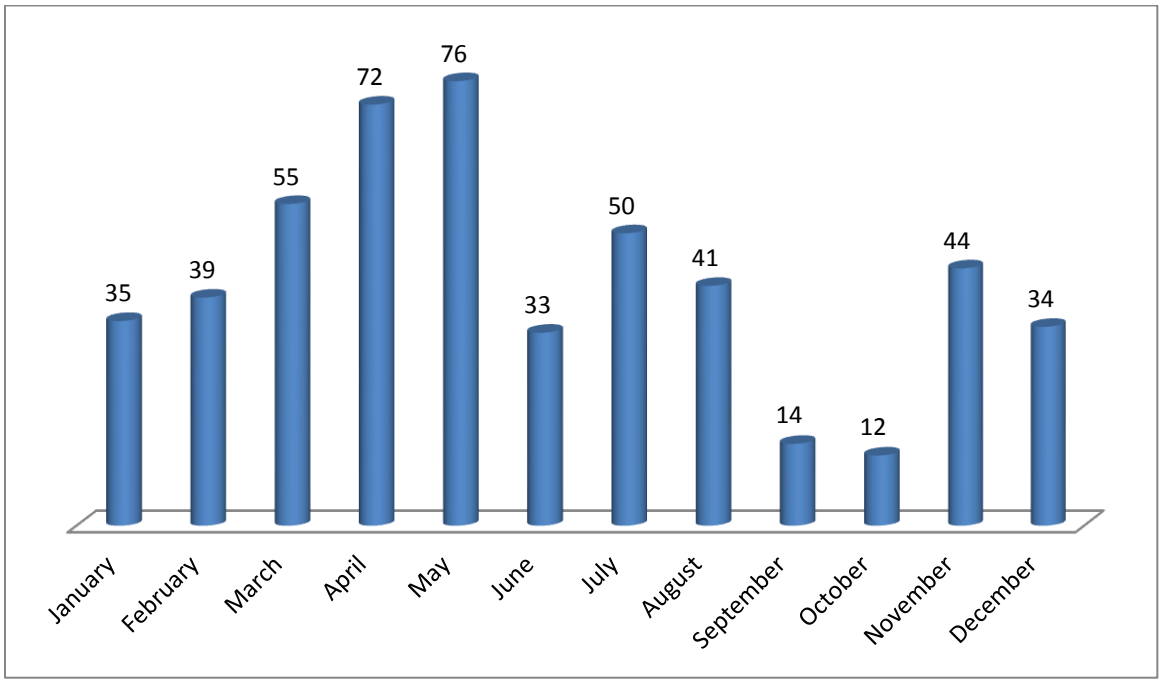


Figure Distribution of cases by month of hospitalization



Results:

Within the positive group, 365 cases were urban, representing 72.3% of the total, and 140 (27.7%) from rural areas. The gender distribution shows a higher proportion of male gender: in the positive group we have 272 male patients, representing 53.9% of the total, and 233 female patients, representing 46.1%. In national and international studies, there is the same slight incidence of male gender.

As seasonality, we noticed an increased incidence in the spring and summer months, although in the literature this is in the cold season. Membership in a community, the high degree of infectivity of rotavirus disease may be an explanation. Of the 505 patients, 94 (18.6%) were hospitalized in December-February, 206 (40.8%) in March-May, 128 (25.3%) in June-August, 77(15, 2%) in September-November.

Age is a determining factor. The mean age in the positive lot was 2.54 years, with extreme values of 4 months and 11 years. The 0-1 year age group recorded 8 patients (1.58%). In principle, infants are protected by breastfeeding and less exposure to infections, and are not part of the community. In case of illness, they are placed in a pediatric department. In our hospital, infected infants had family members hospitalized for acute diarrheal disease. In the literature, the age group of 1-2 years is the most affected. Also in our study this age group has

been found to be the largest number of patients: 229 (45.3%). Between 2 and 3 years, the number of infected patients was 85 (16.83%), between 3 and 4 years were 66 cases (13.06%), between 49 and 5 years were 49 cases (9.7 %), and over 5 years were 68 cases, representing 13.47%. We notice an increased number of cases aged between 5 and 11 years. In the negative group the mean age was 4.34 years, with extremes between 2 and 11 years.

Hospitalization ranged from one day to 21 days, with an average of 6.84 days. The longer the hospital stay, the higher the related expenses. The average length of hospitalization in the negative group was 5.96 days, with extremes between 2 and 15 days.

98 cases were nosocomial infections, representing 19.4% of the total, data comparable to those in international studies.

Of the 505 patients with rotaviral disease, 480 experienced fever (95%). The average maximum temperature was 37.975 degrees Celsius, with extreme values of 37.5 and 39.3 degrees Celsius. In the negative group, 86 patients presented fever. The average maximum temperature in this batch was 37.8 degrees Celsius, with extreme values of 37.5 and 38.8 degrees Celsius. Increased fever associated with diarrheal stools and vomiting has accentuated the degree of dehydration. Fever is also a risk factor for seizures, especially at very young age.

The number of diarrheic stools per day ranged between 3 and 10, with an average of 5,11. Between 3 and 6 diarrheic stools per day were 355 cases (70.3%), and between 6 and 10 stoolrs per day were 150 cases (29.7%). The number of stools is an indicator of the severity of the disease. In the negative group, the mean value of diarrheic stools per day was 4,2. 98 of the patients in this group presented between 3 and 5 stools per day, and 2 of them had 6 diarrheic stools per day.

404 patients presented vomiting (80%); the maximum number of vomits per day was 7. In between 0 and 3 vomitings per day, there were 480 patients (95%), and between 25 and 5 (5%) between 4 and 7 vomiting per day. Vomiting leads to dehydration, general condition alteration, hydroelectrolytic and acido-basic disorders.

In the positive group, dehydration degree I presented 352 patients, representing 69.7%, dehydration degree II presented 146 patients (28.9%) and grade III-7 patients (1,4%). In the negative group, 71 patients had the first degree of dehydration, and 29 patients had a second degree of dehydration.

Toxic condition presented 149 patients (29.5%) in the positive group, while in the negative group 19 patients (19%).

The mean value of hemoglobin was 10.73 g / dL, with extreme values between 6.6 and 14 g / dL in the positive lot.

The white blood cells count / mmc ranged from 2400 to 20700, with an average of 8640.5 / mmc in the positive lot.

Fibrinogen had values ranging from 260 to 710 mg%, with an average of 365.8 mg%.

The mean value of sedimentation rate of the red blood cells was 11.45 mm / 1 hour, with extremes between 4 and 40 mm / 1 hour.

There have been some studies in Romania, one of which is a multicenter one. There are differences between studies. The Anca et al., Multicenter study (nine centers) did not include children over the age of 5 years. The average length of hospitalization was different: 4.75 days in the Marin study, 6 days in the Anca study, 6.84 days in my study. Fever was present in 95% of cases in my study, compared with other studies (86.29% and 78.35%, respectively). The incidence of vomiting was different, in 80% of cases in my study, 88.57% in the Anca study, 89.78% in the Marin study. Regarding age, there are approximately equal values in the three studies in the age group under two years, but the proportion of children over 5 years was higher in my study (13%) compared to the Marin study (8.99%).(18, 21)

Study 2

We analyzed the characteristics of the nosocomial infection group and compared them to the group of simple rotavirus infections. Of the 505 cases, 98 were nosocomial infections, representing 19.4% of the total. Children with such infections have been hospitalized in other hospitals in different departments: pediatrics, pediatric surgery, intensive care; or in our department for another affection.

In table III are described the characteristics of the group with nosocomial infection with rotavirus.

Table III-The characteristics of nosocomial infection with rotavirus

Variable name	
Age(years)[mean, (min-max)]	2,52; (0,5;9)
SexM [mean, (%)]	55; 56,1
SexF [mean, (min-max)]	43; 43,9
Urban environment [N, (%)]	74; 75,5
Rural environment [N, (%)]	24; 24,5
Hospitalization December-February [N, (%)]	23; 23,5
Hospitalization March-May [N, (%)]	46; 46,9
Hospitalization June-August [N, (%)]	10; 10,2
Hospitalization September-November [N, (%)]	19; 19,4
Fever-yes [N, (%)]	97; 98,97
Fever-no [N, (%)]	1; 1,02
Maximum temperature(degrees Celsius)[mean, (min-max)]	38, 28; (37-39,3)
Vomiting-yes[N, (%)]	92; 93,9
Vomiting-no[N, (%)]	6; 6,12
0-3 vomiting/day[N, (%)]	85; 86,7
4-7 vomiting/day[N, (%)]	13; 13,3
3-6 stools/day[N, (%)]	57; 58,2
6-10 stools/day[N, (%)]	41; 41,8
Toxicity-yes[N, (%)]	61; 62,2
Toxicity-no[N, (%)]	37; 37,75
Degree of dehydration I [N, (%)]	36; 36,7
Degree of dehydration II [N, (%)]	55; 56,1
Degree of dehydration III [N, (%)]	7; 7,1
Days of hospitalization[mean, (min-max)]	10,95;(2-27)
Hb(g/dL)[[mean, (min-max)]	10,63;(8,3-13,7)
Leucocytes/mmc[mean, (min-max)]	9735,71; (3000-20700)
Fibrinogen(mg%)[mean, (min-max)]	393,18; (261-710)
ESR(mm/h) [mean, (min-max)]	14,14; (5-40)

Results:

Comparison between the two lots of nosocomial and simple rotaviral infection:

- We notice differences in the number of days of hospitalization, the average being 10.96 days for the group with nosocomial infection and 5.86 days in the group without nosocomial infection; this is due to the fact that patients have acquired rotavirus infection during

hospitalization for another medical condition, or rotavirus disease has occurred over a body already affected to some extent by another disease;

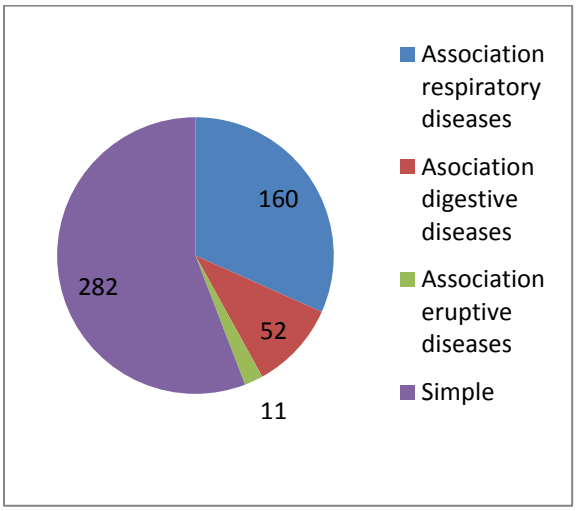
- there are differences in maximum temperature; In the nosocomial group the mean value was 38.28 ° C, while in the single group it was 37.90 ° C; $p = 0.001 < \alpha = 0.05$.
- there are differences in the number of diarrheic stools per day; the mean value/ day was 5.50 in the nosocomial group and 5.017 in the simple group, $p = 0.004 < \alpha = 0.05$. OR = 2.566, Rr = 1.911.
- There were no significant differences in the number of vomits per day; the mean value in the nosocomial group was 2,214 and in the simple group 1,312, while $p = 0,347 > \alpha = 0,05$. OR = 5.386, Rf = 4.804.
- there were no differences regarding age, environment, sex;
- There are differences in the number of leukocytes, in the nosocomial group the mean value is 9735,71 / mmc, in the simple group is 8640,59 / mmc, and $p = 0,001 < \alpha = 0,05$.
- there are differences in the mean value of the rate of sedimentation of the red blood cells in the nosocomial group is 14.14mm / hr, and in the simple group is 11.45mm / hour; $p = 0.001 < \alpha = 0.05$.
- there are no differences regarding the value of fibrinogen (mean value in the nosocomial group is 393.18mg%, and in the simple group is 365, 86mg%), $p = 0.181 > \alpha = 0.05$.
- there are no differences regarding the value of hemoglobin (mean value in the nosocomial group is 10.63g / dL, and in the simple group is 10.73g / dL), $p = 0.68 > \alpha = 0.05$.
- Regarding the degree of dehydration, it is observed that in the simple group there was a small number of cases with degree II dehydration (91 cases, representing 22.35% of the simple group), while in the nosocomial group the proportion of cases with high degree of dehydration was higher (55 cases with grade II, representing 56.12%, 7 cases with grade III, representing 7.36% of the total nosocomial); only in the group of nosocomial infections there were cases with degree III dehydration;
- in view of the toxic condition, we observed a higher proportion of cases in the nosocomial group (61 cases, representing 62.24% of their total) compared to the simple group, where there were 88 cases with toxic condition, which represents 21 , 62% of the total group. OR = 6.163, Rf = 2.949.

The progression of the disease in nosocomial infection was more prolonged and severe.

Study 3:

We divided the studied group into other 4 subgroups: first group with associated respiratory disease (RD) -160 cases; second group with associated digestive disease (DD) -52 cases; third group associated with eruptive disease (ED) – 11 cases; and the fourth group of patients who presented just rotavirus gastroenteritis – RGE - (Simple) – 282 cases.

Figure**:** The four groups of studied patients



In group one respiratory diseases associated with RGE were: pneumonia-35, tonsillitis -72, acute upper respiratory infections-53. In group 2 diseases associated with RGE were: Enterocolitis with Escherichia coli – 21 cases, Enterocolitis with Salmonella – 3 cases, Enterocolitis with Shigella – 8 cases, Enterocolitis with Pseudomonas aeruginosa – 11 cases, Enterocolitis with Klebsiella– 10 cases; Acute viral hepatitis – 1 case. Eruptive diseases associated with RGE were: measles – 3 cases, rubella – 1 case, chickenpox - 3 cases, scarlet fever – 4 cases.

Regarding gender and the background, the groups do not differ.

- As well as the mean age, the four groups do not have significant differences between them: 2.57 years for the group associated with respiratory infections, 2.34 years for the group associated with other digestive diseases, 3.01 years for the group with eruptive diseases, 2.54 years for the simple one.

Regarding the average duration of hospitalization, we noticed significant differences between the simple group, where the average was 5,723 days, and the rest of the groups, where the duration of the hospitalization was prolonged. The mean values of the days of hospitalization were: 8,012 days in the respiratory infection group, 8,577 days in the other with digestive disorders, and 10,64 days in the one associated with eruptive diseases. The highest value was in the group with eruptive diseases.

-The mean maximum temperature was 38.13 ° C in the respiratory infection group, 38.05 ° C in the associated digestive disease, 38.14 ° C in the eruptive disease, 37.87 ° C in the simple ,

relatively equal values. The statistical analysis revealed significant differences between the simple and the respiratory and the associated digestive diseases.

- With regard to the maximum amount of vomiting per day, significant differences were found between the simple and the associated respiratory disease group, and between the single and the other group with other concomitant digestive disorders. For the simple group, the mean value was 1,191, for those with respiratory infections 1,886, 1,806 for the associated digestive disease, for the eruptive disease 1,727.

- The mean values of the maximum number of diarrheal stools per day were 5,188 for the group with associated respiratory conditions, 6,019 for those with concomitant digestive disorders, 5,81 for the eruptive disease and 4,872 for the simple one. The statistical analysis revealed significant differences between the single group and the associated digestive disorder. Patients who had two etiological enterocolitis germs had the most diarrheal stools per day.

- Mean values of hemoglobin were almost the same in the four groups, so there were no differences between them: 10.78 g / dL in the respiratory disease group, 10.81 g / dL in the digestive group, 10.08 g / dL in the one with eruptive disease, and 10.73 g / dL in the simple one.

- Regarding the mean value of white blood cells / mmc, this was: 11182.50 / mmc in the respiratory disease group, 8105.77 / mmc in the group with other digestive diseases, 8490.91 / mmc in the group with eruptive diseases, 7302.84 / mmc in the simple group. The Tamhane Post-Hoc analysis revealed significant differences between the respiratory disease group and each of the other groups.

- The mean values of fibrinogen were: 417.61 mg% in the respiratory disease group, 358.58 mg% in the digestive group, 439 mg in the eruptive group, 335 mg in the single group. Following statistical processing, there were significant differences between the simple group and each of the other groups, between the digestive group and each of the other groups.

- Mean values of the sedimentation rate of the red blood cells were: 16.24 mm / 1 hour in the group with respiratory diseases, 10.90 mm / 1 hour in the group of digestive diseases, 14.82 mm / 1 hour in the group with eruptive diseases, 8,70 mm / 1 hour in the simple one. The statistical processing revealed differences between the group with respiratory disorders and the group with digestive disorders, namely the simple one.

- Nosocomial infections have been found to be 50 cases in the respiratory disease group, 14 cases in the group of associated digestive diseases, 10 in the group of eruptive diseases, 24 cases in the simple group.

The present study is an attempt to implement a method of permanent monitoring of cases of diarrheal disease. The rotaviral disease is a public health issue and a major consumer of medical resources.

I consider rotavirus vaccination necessary in our country to prevent cases of severe illness and its complications in the child.

Key-words: Rotavirus, gastroenteritis, child

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