

ON THE ETIOLOGICAL ROLE OF ROTAVIRUSES AND SOME REPRESENTATIVES OF AEROBIC INTESTINAL MICROFLORA OF CHILDREN'S GASTROENTERITIS

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The authors study the etiologic role of rotaviruses and their relative part in viral and viro-bacterial associations in children's acute gastroenteritis. During the period from November 1979 till April 1980 a total number of 105 children with an acute gastroenteritis were investigated. Dyspeptic syndrome was combined with other attendant infections such as acute catarrh of upper respiratory tract, otitis, bronchopneumonia in 50 % of the children studied. By using a precise bacteriological analysis a pathogenic microflora (*Shigella*, *Salmonella*, *Escherichia coli* 0:111) was isolated in 9 children (8,5 %). 40,9 % of the cases were rotavirus-positive.

The acute infectious gastroenteritis presents a considerable part of children's pathology. Most of these infections are still with unknown etiology. According to Grady and Keusch about 25 % out of all diarrheal cases are due to the known pathogenic intestinal bacteria, about 25 % — to the viruses but the rest 50 % of the cases are with unknown etiology (7). Other investigators accept that the relative part of diarrheas with unknown etiology reaches 60—80 % (9). Especially in children, their course is very severe and they are a serious problem of public health in many countries. In the developing ones the mortality rate reaches up to 17 (1000 concerning new-borns only and 21) 1000 concerning infants aged 1—4 years (8).

Besides the pathogenic intestinal microflora including *Salmonellae*, *Shigellae*, enteropathogenic coli-bacteriae, etc., the viruses play a definite role in the etiology of acute intestinal infections in childhood. The latter ones affect the children, especially at early age and lead rapidly to toxemia and even sometimes to fatal end. Recently, some new-discovered groups of viruses such as rotaviruses, astroviruses, corona-viruses, Norwalkagent, adenoviruses, etc., were recognized as undoubted causative agents of acute gastroenteritis in children.

The purpose of the present work was to investigate the etiologic role of rotaviruses and their relative part of viral and virobacterial associations in acute gastroenteritis in childhood.

Material and methods

During the period from November 1979 till April 1980 a total number of 105 children aged between 0—3 years with a diarrheal syndrome were studied. There were data about attendant infections such as acute catarrh of upper respiratory tract (ACURT), otitis, bronchopneumonia, etc., in 50 % of the cases. Foecal samples from children hospitalized in District Hospital, Varna city (Pediatric Clinic, Infectious Clinic, Children's Home) were investigated. The bacteriologi-

cal analysis was performed after routine methods and the virological one after the method of agar gel immunodiffusion according to modified method of Uchterloni by using an antirotavirus immune serum which was placed at our disposal by Prof. P. Middleton from Canada. An electron microscope investigation was also carried out by using the method of double contrasting with 2 % phosphorwolframic acid. The samples were taken on the 2nd—3rd day at the latest from the onset of disease. A randomly selected contingent of healthy infants from nurseries was used as control. The observations were made with an electron microscope JEM-7A.

Results and discussion

The results from our study are demonstrated on table 1. In 9 children (8,5 %) a pathogenic microflora was isolated by using a precise bacteriological analysis 5 cases with *E. coli* 0:111; 2 ones with *Shigella Flexneri*, 2 with *Salmonella*

Table 1

Children with gastroenteritis examined for rotaviruses and Bacteria

Total number of cases	(+) for rotaviruses	(+) for pathogenic bact.	(+) for fac. pathogenic bacteriae	(+) for rotav. a. bacteriae
105	43	9	27	26
%	40,9	8,5	26,1	24,5

typhi murium). Besides the pathogenic microflora facultatively pathogenic representatives of family Enterobacteriaceae, family Klebsiella, Pseudomonas, Proteus, *E. coli*, etc., were isolated. Bacterial associations were concerned in 27 infants (26,1 %). As shown on the table, 43 infants were rotavirus-positive by using immunodiffusion method while these cases were only 18 % by using electron microscopic one. 26 patients (24,5 %) were both pathogenic bacteria- and rotavirus-negative. Neither pathogenic bacteria, nor rotaviruses were ascertained in the controls.

These data point unambiguously to the fact that rotaviruses have the greatest relative part in the etiology of acute gastroenteritis in small infants, independently of the method of investigation. Another noteworthy fact is that the earlier taking the material the greater percentage of detection of etiologic agent. 39 out of total 43 positive samples of rotaviruses were investigated within the first three days and 4 ones were taken between the 4th and 7th day. Our results coincide with those of other investigators and support the accepted attitude that viral excretion is most ex-

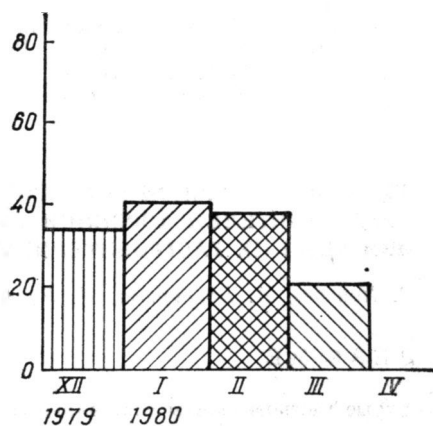


Fig. 1

pressed in the first 3—4 days. Concerning the seasonal distribution of rotaviruses it is generally considered that they occur more frequently in cold months. Its dynamics during the studied period is presented on fig. 1. In November and in April there are no any positive cases while in December they are 13 ones (32,3 %); in January 18 (41,8 %); in February 16 (36,1 %) and in March 7 ones (16,2 %). The outlined dynamics of rotavirus-positive cases suggests a higher frequency of gastroenteritis with rotaviral etiology in cold months (January and February). It is supposed that a correlation between ACURT and viral diarrheas had to be searched for but no any rotaviruses could be isolated from nose-throat smears to the presence.

Numerous authors call these gastroenteritis "winter diarrheas" distinguishing them from those with enteroviral etiology. The latter ones occur more oftenly in summer masked as the so-called "summer influenza" or parallelly to certain pathogenic bacterial agent.

Based on our study the following conclusions could be made:

The rotavirus distribution as an etiologic factor for acute gastroenteritis in children is quite often presented with outlined peak during the coldest winter months. The methods used by us are valuable concerning the diagnostic practice and contribute to precise identification of etiologic agent with a view to correct therapeutic approach. The daily work on diminution of morbidity and eradication of infectiously determined diarrheas in childhood can be done only on the basis of correctly and profoundly performed complex viro-bacteriological investigation.

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ОБ ЭТИОЛОГИЧЕСКОЙ РОЛИ РОТАВИРУСОВ И НЕКОТОРЫХ ПРЕДСТАВИТЕЛЕЙ АЭРОБНОЙ КИШЕЧНОЙ ФЛОРЫ ПРИ ДЕТСКИХ ГАСТРОЭНТЕРИТАХ

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РЕЗЮМЕ

Острые гастроэнтериты составляют значительную часть детской патологии. Даже тщательные клинические и бактериологические исследования не всегда позволяют определить возбудитель заболевания.

Наряду с патологической кишечной флорой в этиологии острых кишечных инфекций у детей определенную роль играют и вирусы. Они особенно характерны для детей раннего возраста, вызывают тяжелые гастроэнтериты, быстро приводящие к токсикозу и имеющие иногда летальный исход.

Целью настоящей работы является исследование этиологической роли ротавирусов и их участие в вирусных и вирусно-бактериальных ассоциациях при острых гастроэнтеритах у детей. С ноября 1979-го года по апрель 1980-го года было исследовано 105 детей, больных острым гастроэнтеритом. У 50 % детей диспептический синдром сочетался с другими сопутствующими инфекциями как ОКГДП, отит, бронхопневмония и др. При тщательном бактериологическом анализе у 9 (8,5 %) детей была изолирована патогенная кишечная флора: Шигела, Сальмонелла, Эшерихия коли 0 111, а в 40,9 % всех случаев были обнаружены ротавирусы.