JOURNAL OF CLINICAL MICROBIOLOGY, Sept. 1982, p. 568–569
0095-1137/82/100568-02$02.00/0

Vol. 16, No. 3

Incidence of Rotavirus Infection in Different Age Groups of Pediatric Patients with Gastroenteritis

ALLAN L. TRUANT[1]* AND TASNEE CHONMAITREE[2]

Clinical Microbiology Division, Department of Pathology,[1] and Infectious Disease Division, Department of Pediatrics,[2] University of Texas Medical Branch, Galveston, Texas 77550

Received 1 April 1982/Accepted 1 June 1982

An enzyme immunoasssy was used to detect rotavirus in the stools of 176 pediatric patients presenting with gastroenteritis. The highest incidence of rotavirus infection was found among patients less than 1 year of age. In contrast to previously reported studies, 23% of neonates with gastroenteritis had rotavirus in their stools. This relatively easy and rapid method was helpful in the management of pediatric patients with gastroenteritis.

Rotavirus has been shown to be an important cause of acute gastroenteritis in pediatric patients (2, 3). The highest rate of infection has been reported to occur in patients 6 to 24 months of age (2). Electron microscopic analysis has proven to be a valuable technique by which these agents can be documented in patients with acute infections. Recent studies however, have confirmed that enzyme immunoassays are rapid, sensitive, and specific alternatives to electron microscopy for the detection of these agents in diarrheal specimens (6, 8).

We studied the incidence of rotavirus in 176 pediatric patients (newborn through 15 years of age) presenting with gastroenteritis at the University of Texas Medical Branch Hospitals over a 14-month period (January 1981 to February 1982). Specimens were tested by enzyme immunoassay (Rotazyme; Abbott Laboratories, Chicago, Ill.) according to the manufacturer's instructions.

Rotavirus was detected (Table 1) frequently from fresh, unfrozen diarrheal stools from patients less than 1 year of age. It appeared that this group of patients, including neonates, comprised the major group seeking medical attention. Of 22 neonates with gastroenteritis, 5 (23%) had rotavirus in their stools. The incidence of rotavirus infection in neonates was comparable to the incidence of infection in infants 12 to 24 months of age at the University of Texas Medical Branch Hospitals during this study period. Three of five neonates had acute onset of numerous watery stools per day lasting for 2 to 3 days and required oral electrolyte replacement. One neonate presented with chronic diarrhea which had been present since the age of 3 weeks; intravenous fluid therapy was required because of mild dehydration. The other neonate had mucous bloody stools and abdominal radiographic findings consistent with necrotizing enterocolitis and was treated with intravenous fluids, ampicillin, and gentamicin. Four of four neonates tested had stool cultures negative for bacteria (stool culture was not evaluated in one neonate with acute onset of symptoms).

The highest incidence of infection (39%) was among infants between 7 and 12 months of age. In older pediatric patients (2 to 15 years of age), rotavirus was identified less frequently from symptomatic individuals. Independently, we also detected rotavirus by enzyme immunoassay in two adult patients presenting with gastrointestinal distress (female, 22 years; male, 34 years). The importance of this agent in adult diarrheal disease is yet to be fully defined.

Our finding of a high incidence of rotavirus infection among symptomatic neonates and infants under 6 months of age is different from previous reports. Kapikian et al. (2) found a much lower rate of infection among infants under 6 months of age as compared to those between 6 to 24 months. Others have found that neonates excreting rotavirus in stools were mostly asymptomatic (1, 5, 7). This report and data from a previous longitudinal study (4) suggest that rotavirus may be a significant cause of gastroenteritis in neonates. Efforts should be made to identify this virus in the stools of neonates with gastroenteritis, especially in the winter.

Since rotavirus can be detected by direct electron microscopy, immune electron microscopy, and more recently by enzyme immunoassays, those centers responsible for the laboratory diagnosis of rotavirus infections have several reliable alternatives. This laboratory has

TABLE 1. Incidence of rotavirus infection in pediatric patients[a] with symptoms of gastroenteritis

Age	Total no. of patients	No. rotavirus positive[b]	% Positive
Neonates (<1 mo)	22	5[c]	23
1 mo	11	2	18
2 mo	24	6	25
3 mo	17	6	35
4 mo	15	5	33
5 mo	7	7	100
6 mo	8	2	25
1–6 mo (totals)	82	28	34
7 mo	8	4	50
8 mo	8	3	38
9 mo	1	0	0
10 mo	7	3	43
11 mo	4	1	25
12 mo	0	0	0
7–12 mo (totals)	28	11	39
12–24 mo	21	5	24
2–15 yr	23	5	22

[a] Data represent patients whose fecal material either contained rotavirus antigens ranging from 1+ through 4+ visual colorimetric change by Rotazyme enzyme immunoassay or lacked detectable rotavirus antigens as determined by negative or +/− readings. The patients included 76% inpatients and 24% outpatients.

[b] Patients determined to be rotavirus positive or tested multiple times were entered only once in these data. No nosocomial outbreaks were documented in these data.

[c] One patient from this group who presented with chronic diarrhea since 3 weeks of age was tested for rotavirus at 6 weeks of age and placed in the neonatal age group.

found the enzyme immunoassay to be very valuable in patient management at the University of Texas Medical Branch Hospitals. The infected patient can be properly isolated and managed, and the course of excretion can be followed. The test has also been helpful in following the course of a particularly difficult patient with severe combined immunodeficiency disease, who among many other complications demonstrated a chronic and occasionally cyclical excretion of rotavirus. A complete case report of this presentation will be described in a separate communication.

We thank Lena Gillis and Helen Griffiths for excellent technical assistance.

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