

SHORT REPORTS

Detection of rotavirus in handwashings of attendants of children with diarrhoea

Rotavirus diarrhoea is common in infants and young children and appears to have a worldwide distribution. While faecal-oral route of transmission has been reported,¹ potential vehicles of transmission are not known. Nosocomially acquired outbreaks of rotavirus diarrhoea have occurred in nurseries² and paediatric wards³ in developed countries. None the less, we have detected rotavirus in handwashings of attendants of patients with rotavirus diarrhoea more often than in those of attendants of children with non-rotavirus diarrhoea.

Patients, methods, and results

The subjects for the study comprised 147 children aged under 5 years admitted to this centre for treatment of diarrhoea. Selection was based on inclusion of the first four children admitted each day. Stools were collected on admission for detection of rotavirus.

Within four hours of these admissions the hands of all attendants were washed thoroughly in a sterilised bowl with 100 ml tap water and the washings examined for rotavirus. A 20% sample of tap water used for washings was sampled at random also for detection of rotavirus. The hand-washing water and sampled tap water were concentrated by an adaptation of the polyethylene glycol hydroextraction method,⁴ in which handwashings were poured into a 30 cm dialysing tube 3.2 cm wide (MW Cutoff 12000-14000) and knotted for closure. After completely covering with polyethylene glycol 4000 the tube was stored at 4°C overnight during which time water was completely extracted. The tube was then washed thoroughly with running tap water to remove the polyethylene glycol from its outer surface, cut 1 cm below the knot, and 2.5 ml tryptose phosphate broth introduced into it. The open end of the tube was securely held between the fingers and shaken completely to wet the inside surface with the broth. The concentration was then passed through a 0.2 µm membrane filter (Millipore) and the filtrate stored at 4°C until tested for rotavirus. Stool specimens and handwashing concentrates were tested for rotavirus antigen using a confirmatory ELISA test, in which plates were pre-coated in alternate wells with rotavirus immune and non-immune sera of the same goat.⁵ All laboratory assays were performed blind.

Rotavirus diarrhoea was more common among children aged 3-23 months. Handwashings of 78.6% of the attendants of patients (n=70) with rotavirus diarrhoea and 19.5% of attendants of patients with non-rotavirus diarrhoea (n=77) were positive for rotavirus antigen (p<0.001). The rate of detection of rotavirus in handwashings of attendants of patients with rotavirus diarrhoea was significantly higher in younger children (0-23 months) than in older children (24-59 months) (p<0.02; table). None of the samples of tap water contained rotavirus.

Detection of rotavirus from handwashing of attendants of children of various ages with diarrhoea

Age (months)	Rotavirus in handwashing	Attendants		p Value
		Rotavirus diarrhoea	Non-rotavirus diarrhoea	
0-23	+	50	12	(a) v (c) p<0.001*
	-	9 (a)	37 (c)	
24-59	+	5	3	(b) v (d) p=0.027†
	-	6 (b)	25 (d)	
p Value		(a) v (b) p<0.02* (c) v (d) p=0.114		

* 2 x 2 χ² test.

† One-tailed Fisher exact test.

Comment

This study shows that rotavirus can be detected by a simple method from handwashings of attendants of patients. The high rate of detection in attendants of patients with rotavirus suggests that the method is a sensitive indicator of faecal contamination of hands and may be useful in future studies to trace rotavirus transmission. That rotavirus was found in the hand washings of 19.5% of attendants of patients with non-rotavirus diarrhoea suggests that they may have come into contact with other attendants and patients in adjacent beds. This implicates a

possible role for hands in the spread of rotavirus infection. Hospital outbreaks of rotavirus infections^{2,3} might have been due to contamination of hands.

The detection rate of rotavirus from the handwashings of attendants of younger children with rotavirus diarrhoea was higher than that in handwashings of attendants of older children. This may be due to the closer contact of attendants with younger children. Alternatively younger children may excrete more virus than older children, since the older children might be partially immune from an earlier infection.

¹ World Health Organisation sub-group of the Scientific Working Group on Epidemiology and Etiology. *Rotavirus and other viral diarrhoeas*. Geneva: WHO, 1979. (WHO/DDC/EPE/79.2.)

² Bishop RF, Hewstone AS, Davidson GP, Townley RRW, Holmes IH, Ruck BJ. An epidemic of diarrhoea in human neonates involving a rotavirus-like agent and "enteropathogenic" serotypes of *Escherichia coli*. *J Clin Pathol* 1976;**29**:46-9.

³ Ryder RW, McGown JE, Hatch MH, Palmer EL. Rotavirus-like agent as a cause of nosocomial diarrhoea in infants. *J Pediatr* 1977;**90**:698-702.

⁴ Ramia S, Sattar SA. Second-step concentration of viruses in drinking and surface waters using polyethylene glycol hydroextraction. *Can J Microbiol* 1979;**25**:587-92.

⁵ Kapikian AZ, Yolken RH, Greenberg HB, et al. *Diagnostic procedures for viral, rickettsial and chlamydial infections*. 5th ed. Washington DC: American Public Health Association, 1979.

(Accepted 6 October 1982)

International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), GPO Box 128, Dacca-2, Bangladesh

AZIZ R SAMADI, MD, DPH, head, disease transmission programme
MOHAMMAD I HUQ, DBACT, PHD, head, microbiology branch
QUAZI S AHMED, MSC, senior research officer

Reactive arthritis associated with *Staphylococcus epidermidis* peritonitis in patient undergoing continuous ambulatory peritoneal dialysis

The term reactive arthritis was introduced by Aho *et al*¹ to describe several forms of joint disease associated with infection elsewhere in the body. We describe a patient undergoing treatment for renal failure by continuous ambulatory peritoneal dialysis who developed arthritis after an episode of peritoneal infection caused by *Staphylococcus epidermidis*, a bacterium not previously described as an aetiological agent in reactive arthritis.

Case report

A 62 year old man with end-stage renal failure secondary to hypertension was started on continuous ambulatory peritoneal dialysis in July 1981. Four months later a peritoneal infection with *S epidermidis* was treated successfully with cefuroxime. Over the next six months he had four further episodes of abdominal pain and cloudy peritoneal dialysis fluid. No organisms were isolated from the peritoneal fluid, but the symptoms and signs resolved after a short course of antibiotics on each occasion.

In March 1982 he had a further episode of abdominal pain and cloudy peritoneal fluid. Culture of dialysis fluid grew *S epidermidis*, and a course of intravenous and intraperitoneal cefuroxime was given. Again the symptoms and signs of the peritoneal infection resolved. Three weeks later he began to complain of pain in the neck, shoulders, elbows, wrists, and lumbar region, and subsequently of pain and swelling of all the metacarpophalangeal and proximal interphalangeal joints of both hands. There was no history of diarrhoea or urethritis, and the skin, mucous membranes, penis, and eyes were normal.

Investigations showed erythrocyte sedimentation rate 100 mm in the first hour, later falling to 5; haemoglobin concentration 8.5 g/dl; white cell count 11.4 x 10⁹/l; calcium concentration 2.53 mmol/l (10 mg/100 ml); phosphorus concentration 1.32 mmol/l (4 mg/100 ml); and alkaline phosphatase activity 201 IU/l. Blood and stool cultures gave negative results for *Shigella*, *Salmonella*, and *Campylobacter*. Rheumatoid and antinuclear factors were not