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An outbreak of rotavirus infection in a long-stay ward of a geriatric hospital

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SUMMARY An outbreak of rotavirus infection in elderly patients in a long-stay ward of a geriatric hospital is described. Virus was detected in 7/15 (47%) symptomatic individuals. Four members of staff were among those affected. The findings emphasise the need for electron microscopy to be used in the initial investigation of outbreaks of diarrhoea in all age groups.

In a recent study¹ we investigated a hospital outbreak of rotavirus infection which occurred in adults in a cardiology ward. Patients and members of the staff were affected, and strict isolation procedures were required to bring the outbreak under control.

This report describes a further outbreak of rotavirus infection involving adults in hospital. The incident took place in the long-stay ward of a geriatric hospital in north-west London in which no facilities for isolation were available. Members of the staff and patients were again affected.

The wards

The unit consisted of two wards of the Nightingale design, one for male the other for female patients, separated by offices for the nursing staff. Each ward contained a lounge area, and a separate small lounge was available for the more mobile individuals. Toilet facilities were provided for each of the wards but the majority of patients were unable to help themselves, and commodes and disposable bedpans were usually used and bowls were provided for handwashing. As the workload on this unit was heavy, care was taken to keep the wards well-staffed, and both wards were clean and well maintained.

The outbreak

The outbreak occurred during a three-week period in March 1979. The first case was believed to have been an 81-year-old uraemic man who developed diarrhoea on 7 March and died a week later. Subsequently, 10 patients (aged between 65 and 90 years) and four members of the nursing staff

developed nausea and diarrhoea which consisted of one or two loose stools per day. Symptoms lasted for two to seven days and were generally mild. In contrast, severe illness has been noted by other workers in a small number of adults.^{2 3}

When rotavirus was established as the likely cause of symptoms the ward was closed to admissions, and staff movement from this unit to other wards was discontinued. The unit was reopened 12 days after the onset of symptoms in the last case.

Laboratory investigations

After routine bacteriological examination of samples from symptomatic individuals had failed to reveal a causative agent, specimens were referred to us for screening by electron microscopy. Samples from all the patients and staff on this unit were examined for the presence of rotavirus. Serial samples were obtained from all individuals found to be excreting rotavirus and from any patient who subsequently developed symptoms. The screening procedure was repeated 10 to 12 days after the onset of symptoms in the last case.

Results

During the outbreak, specimens from all individuals on the affected wards (22 patients and 17 members of staff) were examined for the presence of rotavirus (Table 1). Virus was detected in samples from seven (46.6%) of 15 symptomatic individuals, including the 26-year-old ward sister. None of the 27 asymptomatic individuals was found to be excreting virus when initially screened, but three of these (two females and one male) subsequently developed diarrhoea with concurrent rotavirus excretion.

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Table 1 Detection of rotavirus in patients and staff

	Patients (65-90 years)	Staff (20-40 years)	Total
Individuals examined	22	17	39
Number with symptoms	11	4	15
Number with rotavirus	6	1	7

Rotavirus was not detected from any asymptomatic individuals

Final screening of both patients and staff 10 to 12 days after the occurrence of the last case showed that rotavirus was no longer present.

Discussion

In a previous report¹ we suggested that rotavirus may cause outbreaks of diarrhoea in adults and that patients of the 60-90 year age group are particularly at risk. This theory is supported by the results of antibody studies in different age groups⁴ which demonstrate the continuing fall in antibody to rotavirus after 3 years of age. This new outbreak, in which symptoms were again confined to patients over 60 years of age, lends further support to this view. In both episodes (Table 2) there was a noticeably higher attack rate among female patients. In hospital 1 (Table 2) the difference in attack rates was significant ($0.02 > p > 0.01$), although in the second episode this was not apparent ($0.1 > p > 0.05$). These findings are consistent with a lower level of immunity in females of this age group, a finding supported by the work of others.^{4,5} The antibody response of adults involved in this outbreak of rotavirus infection is being investigated at the present time. A further point of interest is the involvement in each episode of several younger members of the staff (aged 20-30 years), a fact of great importance in the management of such outbreaks. In the control of both these episodes staff movement to other wards was restricted, but further management was influenced by the very different environments in which they took place. In the geriatric hospital the lack of isolation facilities

necessitated the closure of the unit to admissions. This was possible only because patient turnover was extremely low. With the use of these measures the outbreak lasted for a period of three weeks, which is likely to have been its natural duration. In contrast, the previous outbreak took place in a unit that was not closed as it had a high case turnover consisting of acute medical emergencies. This unit had ideal isolation facilities and when these were used the outbreak was halted within two weeks, although throughout this time admissions to the unit continued.

Our findings from these two studies strongly suggest that rotavirus infection is an important cause of outbreaks of diarrhoea in adults in closed communities and demonstrate that appropriate control measures can limit the extent of such outbreaks. As a result of our interest in illness in the 60 plus age group, we have detected several further outbreaks of rotavirus infection in adults in hospitals in north-west London in which the severity of illness ranged from very mild symptoms to severe vomiting and diarrhoea resulting in a protracted stay in hospital. These findings indicate that, contrary to popular belief, spread of rotavirus among adults is not an uncommon event.

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Table 2 Two outbreaks of rotavirus infection in adults

	Hospital 1*			Hospital 2		
	Symptoms	Asymptomatic	Total	Symptoms	Asymptomatic	Total
Male	5	12	17	5	8	13
Female	5	2	7	6	3	9
Total	10	14	24	11	11	22

Difference in female/male attack rates (chi-square test with Yates' correction)

Hospital 1 $\chi^2 = 5.53$ $0.02 > p > 0.01$

Hospital 2 $\chi^2 = 3.01$ $0.1 > p > 0.05$

* Outbreak in hospital 1 described in reference 1.

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