

VEROTOXIN-PRODUCING E. COLI (VTEC) 2001-2002

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Infection with verotoxin-producing *E. coli* (VTEC) is a frequently occurring zoonosis, EPI-NEWS 9/03. VTEC causes gastroenteritis, often in the form of bloody diarrhoea. The most serious complication of VTEC is haemolytic uraemic syndrome (HUS).

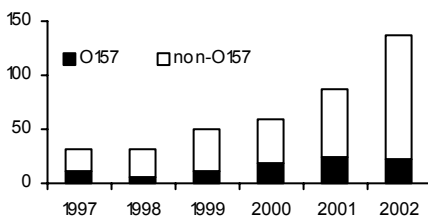
Notified cases

In 2001, 93 cases of VTEC infection were notified to the Department of Epidemiology. Of these, six were complicated with HUS. In 2002, 128 cases were notified, two of which also had HUS. In addition, in 2001 two patients were notified with clinical HUS, and a further two in 2002. One of the patients in 2001 died.

Laboratory-diagnosed cases

The number of notified cases of VTEC, especially non-O157, is still increasing, Fig. 1. There were 87 and 137 (2.6 per 10⁵) recorded cases in 2001 and 2002 respectively. The incidence is similar to that of *Shigella* infection (139 cases) in 2002.

Fig. 1. Number of laboratory-diagnosed cases of VTEC infection, 1997-2002



In 2001-2002, 89 (40%) of the patients were children under 5 years of age. Among patients over 40 years, there was a predominance of females (78%). As in previous years, there was seasonal variation, with most cases occurring in summer.

Laboratory diagnosis

Laboratory diagnosis of VTEC is carried out either by slide agglutination of suspected colonies with a panel of OK antisera or by using DNA probe diagnostics. DNA probe diagnostics is performed primarily in the counties of Aarhus, Funen, Frederiksborg, Storstrøm, Bornholm and Roskilde, and in the municipalities of Copenhagen and Frederiksberg. The incidence was higher in the counties that use DNA-based diagnostics, table 1. However, there was great variation between all counties. In the period 2001-2002, a total of 228 isolates from 224 patients were

Table 1. Number and incidence per 10⁵ for patients with VTEC under and over 5 years, in relation to laboratory diagnostic methods used, 2001-2002

Age (yrs)	Counties with DNA probe diagnostics		Counties with traditional diagnostics	
	No. (Incidence per 10 ⁵)		No. (Incidence per 10 ⁵)	
	2001	2002	2001	2002
0-4	30 (18,2)	38 (23,2)	7 (4,0)	14 (8,1)
5+	42 (1,7)	74 (3,0)	8 (0,3)	11 (0,4)

characterised, table 2. The most commonly occurring serotype was O157:[H7]. Five different types of non-O157 O-groups together made up 45% of those characterized.

Symptoms

A total of 28% of the patients had bloody diarrhoea. Among those identified with O157, 55% had bloody diarrhoea. Of the 53 patients admitted to hospital, eight (15%) had HUS; O157 was isolated from two (25%), and non-O157 from six (75%): O26 (2), O111, O121 and O149 (1 each), and one patient had both VTEC O145 and O21. With the exception of one patient aged 7 years, all patients with HUS were under 3 years of age. In nine people travelling abroad to Asia, Africa and Cuba, a special travel-associated VTEC type O117:K1:H7 was identified. This type seems to cause persistent gastroenteritis.

Sources of infection

VTEC is found primarily in ruminants, from which it may spread to foodstuffs and the environment, including water. Because of the low infectious dose, VTEC is also transmitted by person-to-person spread.

In 2001-2002, 18% of the patients had

Table 2. Most commonly occurring VTEC O groups, 2001-2002

O group	No.	(%)	eae*
O157:[H7]	47	(20)	+
O26	36	(16)	+
O103	26	(11)	+
O146	16	(7)	-
O145	15	(7)	+
O117	9	(4)	-
O111	7	(3)	+
Other serotypes (eae pos.)	15	(7)	+
Other serotypes (eae neg.)	59	(26)	-
I alt	230	(100)	

*The eae gene (*E. coli* attaching and effacing gene) is an important virulence factor in VTEC

acquired the infection during foreign travel.

Twelve family outbreaks were recorded in this period. In nine families, two people were infected with the same VTEC strain. In one family with proven O157, one of the children developed HUS. In three families, the strains of VTEC had different O types. In one other family, two brothers were infected, with VTEC O26 and EPEC O26, respectively.

Hygienic precautions and management of long-term carriers

To reduce the risk of secondary infection, particularly in institutions, it is important to follow the National Board of Health's guidelines (no. 61 of 14 April 2000) concerning persons resident in child-care institutions, those associated with nursing homes or hospitals, or who work in the food industry.

For asymptomatic excretors of VTEC, these guidelines may have consequences in terms of work and social circumstances. For this reason, in selected cases, antibiotic treatment of VTEC may be attempted in healthy long-term carriers. The treatment should only commence after individual assessment in consultation with the doctors at the Department of Gastrointestinal and Parasitic Infections (SSI), and after characterisation of the bacteria strain involved. Treatment in the acute phase of illness is contraindicated, as antibiotic treatment during the illness may increase the risk of HUS.

Case-control study

To gain greater knowledge of sources of infection and risk factors, SSI and the Danish Zoonosis Centre commenced a two-year case-control study on 1 May 2003. In connection with this, all patients with verified VTEC infection will be invited to take part in a questionnaire survey.

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Patients with selected individually notifiable diseases

Notifications received during the 1st quarter of 2003, compared with the corresponding period in 2002

County	Tuberculosis		Meningococcal disease		Pertussis < 2 yrs		Chronic Hepatitis B		Hepatitis A		AIDS	
	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002
Cph. Municipality	34	25	3	3	4	7	11	3	1	7	1	7
Frb. Municipality	4	4	-	-	2	1	-	-	-	2	-	1
Cph. County	16	20	7	2	1	8	5	3	3	-	-	2
Frederiksborg	2	6	-	4	4	10	11	1	-	-	-	-
Roskilde	4	-	-	1	4	1	1	3	-	-	1	-
West Zealand	2	3	-	4	3	8	5	1	-	1	-	2
Storstrøm	6	2	2	1	7	6	2	-	-	-	-	-
Bornholm	-	-	-	-	-	-	2	2	-	-	-	-
Funen	9	11	1	3	3	11	7	2	-	-	-	-
South Jutland	3	1	4	1	3	-	1	-	1	-	-	-
Ribe	-	3	1	3	6	-	2	-	1	-	-	-
Vejle	8	3	4	2	5	6	1	2	-	1	1	1
Ringkøbing	5	2	3	6	3	4	1	-	9	-	2	-
Aarhus	8	12	4	6	5	9	6	3	2	6	-	-
Viborg	3	4	4	1	4	10	-	3	-	-	1	-
North Jutland	15	12	5	3	1	6	1	5	-	1	1	-
Other	1	4	-	-	-	-	1	-	-	-	-	1
Total	120	112	38	40	55	87	57 *	28	17	18	7	14

* The increased number is due to intensified surveillance

Patients with other individually notifiable diseases

Notifications received during the 1st quarter of 2003 compared with the corresponding period in 2002

	1st quarter (whole DK)	
	2003	2002
Creutzfeldt-Jakob disease	1	2
Foodborne diseases	64	117
Hepatitis B - acute	10	11
Hepatitis C - acute	1	-
Hepatitis C - chronic	62	57
Hib-meningitis	-	-
Legionella pneumonia	25	15
Measles	-	24
Mumps	-	1
Neuroborreliosis	6	7
Paratyphoid fever	2	1
Pneumococcal meningitis	36	-
Psittacosis (ornithosis)	1	37
Shigellosis	31	3
Typhoid fever	4	-
VTEC/HUS	16	21

Patients with laboratory-diagnosed RSV and rotavirus infections

1st quarter of 2003 compared with 1st quarter of 2002

	RSV		Rota	
	2003	2002	2003	2002
January	575	314	90	36
February	376	334	132	28
March	129	191	145	44
Total	1080	839	367	108

Reported from the following Clinical Microbiology departments:

Aalborg Hospital (South), Aarhus Municipal Hospital, Herning Central Hospital, Hvidovre Hospital, Odense University Hospital, Slagelse Central Hospital, Viborg Hospital, Dept. of Virology, Statens Serum Institut.

(Dept. of Epidemiology)