EPI-NEWS

NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES

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VTEC AND OTHER DIARRHOEAGENIC E. COLI, 2003-2004

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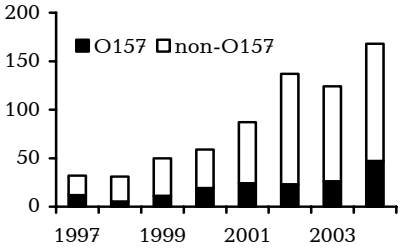
Verocytotoxin producing E. coli (VTEC) is a common zoonosis.
VTEC produces verocytotoxin and causes gastroenteritis, often with bloody diarrhoea.
The most serious complication of VTEC is haemolytic uraemic syndrome (HUS). Because of the risk of serious complications, VTEC, as the only E. coli group causing diarrhoea, is individually notifiable.
In the event of secondary infection, especially in institutions, the Danish National Board of Health's guidelines (no. 61 of 14 April 2000) concerning persons associated with child care centres, nursing homes or hospitals, or who are working in the food industry should be followed, see www.sst.dk. Additional information is available in EPI-NEWS 20/03.

Notified VTEC cases
In the period 2003-2004, 272 cases of VTEC were notified. Of these, 128 (47%) were <15 years of age. A total of seven patients was diagnosed with clinical HUS. Reminders were sent out for 88 (32%) notifications.

Laboratory diagnosed cases
After a slight decline to 124 cases in 2003, the number of laboratory diagnosed VTEC cases increased to 168 in 2004 (3.1 per 10^5), figure 1.

Figure 1. Number of laboratory diagnosed VTEC cases, 1997-2004



The increase can be ascribed particularly to two E. coli O157 outbreaks in 2004; one outbreak related to a foodstuff, EPI-NEWS 1/05, and one related to a visiting farm, EPI-NEWS 25/04.

Diagnostics
In counties with molecular diagnostics (Aarhus, Funen, Frederiksborg, Storstrøm, Bornholm and Roskilde counties and parts of the City of Copenhagen and the City of Frederiksberg), corresponding to about 46% of the population, the incidence was six to eight times higher than in counties using other diagnostic methods, table 1.

Table 1. Number and incidence of laboratory diagnosed VTEC cases under and over the age of five, by diagnostic method, 2003-2004

	Counties with molecular diagnostics No. (incidence per 10^5)		Counties with other diagnostics No. (incidence per 10^5)	
Age (yrs)	2003	2004	2003	2004
0-4	31 (19.2)	48 (29.7)	6 (3.5)	12 (7.1)
5+	79 (3.2)	96 (3.9)	8 (0.3)	12 (0.5)

There was great variation between all counties.
In the period 2003-2004, a total of 275 isolates from 272 patients was characterised, table 2. O157:[H7] was the most commonly occurring serotype.

Table 2. Most commonly occurring VTEC O groups, 2003-2004

O group	No.	(%)	eae*
O157:[H7]	73	(26)	+
O103	39	(14)	+
O146	20	(7)	-
O26	17	(6)	+
O128ab	9	(3)	-
O145	7	(3)	+
O117	7	(3)	-
O111	7	(3)	+
Other serotypes	68	(25)	-
Other serotypes	28	(10)	+
Total	275	(100)	

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

HUS
In the period 2003-2004, O157:H7 was isolated from six of the seven HUS patients and O26:H11 from one patient. Five patients with HUS were under the age of four. On the basis of the analysis of all VTEC isolates in the period 1997-2004, with the exception of O103:H2 which is verocytotoxin 1 and eae positive, an increased risk of complication with HUS in VTEC patients with verocytotoxin 2 and the eae gene, regardless of serotype, was recorded.

Other diarrhoeagenic E. coli
Diarrhoeagenic E. coli (DEC) are divided into main groups on the basis of the clinical picture they may cause, and are characterised by different virulence factors. Apart from VTEC, the following DEC groups are found:
1) The intimin producing E. coli are positive for the eae gene. This gene codes for intimin, which is associated with destruction of the gut epithelial cells, in what is known as the "attaching and effacing lesion".
1a) The enteropathogenic E. coli (EPEC) are a subgroup of the intimin producing E. coli. These are characterised by belonging to only a limited number of O:H serotypes, within only 11 O groups: O26, O55, O86, O114, O119, O111, O125, O127, O128, O142 and O158.
1b) A new group of possible EPEC includes the three O groups O103, O145 and O157. These O groups can also be VTEC.
2) The enterotoxigenic E. coli (ETEC) produce enterotoxins.
3) The enteroinvasive E. coli (EIEC) invade the large intestine's epithelial cells.
The number of laboratory diagnosed DEC is shown in table 3.

Table 3. Number of laboratory diagnosed diarrhoeagenic E. coli, 2003-2004

	2003	2004
VTEC	124	168
Intimin producing E. coli	966	1155
ETEC	244	326
EPEC	218	297
EIEC	12	49
Total	1564	1995

Comments
VTEC is now more commonly diagnosed than Shigella infection, and ETEC and EPEC are more common than both Shigella and Yersinia.
The intimin producing E. coli comprise the most common group of DEC. Presumably, not all intimin producing E. coli are pathogenic, since a considerable number of children are healthy carriers. The occurrence of DEC is probably underestimated, as the number is higher in counties with molecular diagnostics: 92% (ETEC), 90% (intimin producing E. coli), 87% (VTEC), 85% (EPEC) and 85% (EIEC) of all DEC were recorded in counties with molecular diagnostics.

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Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2005 figures are preliminary)

Table 1	Week 16 2005	Cum. 2005 [1]	Cum. 2004 [1]
AIDS	0	20	9
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	0
Creutzfeldt-Jakob	0	2	4
Diphtheria	0	0	0
Food-borne diseases	8	94	137
of these, infected abroad	1	20	17
Gonorrhoea	6	180	91
Haemorrhagic fever	0	0	0
Hepatitis A	1	34	41
of these, infected abroad	0	8	8
Hepatitis B (acute)	1	16	10
Hepatitis B (chronic)	0	47	52
Hepatitis C (acute)	0	1	1
Hepatitis C (chronic)	3	90	120
HIV	6	107	87
Legionella pneumonia	0	18	23
of these, infected abroad	0	2	2
Leprosy	0	0	0
Leptospirosis	1	8	1
Measles	0	0	0
Meningococcal disease	0	26	38
of these, group B	0	18	24
of these, group C	0	1	5
of these, unspec. + other	0	7	9
Mumps	0	2	0
Neuroborreliosis	0	15	50
Ornithosis	0	7	2
Pertussis (children < 2 years)	0	68	64
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	0	1
Listeria monocytogenes	0	1	1
Streptococcus pneumoniae	0	35	42
Other aethiology	0	1	3
Unknown aethiology	1	2	7
Under registration	5	33	-
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis	2	31	24
of these, infected abroad	2	29	19
Syphilis	0	33	57
Tetanus	0	2	0
Tuberculosis	8	129	110
Typhoid/paratyphoid fever	0	11	7
of these, infected abroad	0	10	5
VTEC/HUS	2	41	45
of these, infected abroad	1	17	7

[1] *Cumulative number 2005 and in corresponding period 2004*

Selected laboratory diagnosed infections

Number of specimens, isolates, and/or notifications received in SSI laboratories

Table 2	Week 16 2005	Cum. 2005 [2]	Cum. 2004 [2]
Bordetella pertussis			
(all ages)	4	219	226
Gonococci	4	134	92
of these, females	1	19	12
of these, males	3	115	80
Listeria monocytogenes	0	10	10
Mycoplasma pneumoniae			
Resp. specimens [3]	8	550	53
Serum specimens [4]	14	421	151
Streptococci [5]			
Group A streptococci	2	50	48
Group B streptococci	1	17	21
Group C streptococci	0	5	7
Group G streptococci	2	41	32
S. pneumoniae	21	492	572
Table 3	**Week 14 2005**	**Cum. 2005 [2]**	**Cum. 2004 [2]**
Pathogenic int. bacteria [6]			
Campylobacter	19	489	595
S. Enteritidis	10	94	79
S. Typhimurium	2	81	88
Other zoon. salmonella	11	130	116
Yersinia enterocolitica	5	58	41

[2] *Cumulative number 2005 and in corresponding period 2004*

[3] *Resp. specimens with positive PCR*

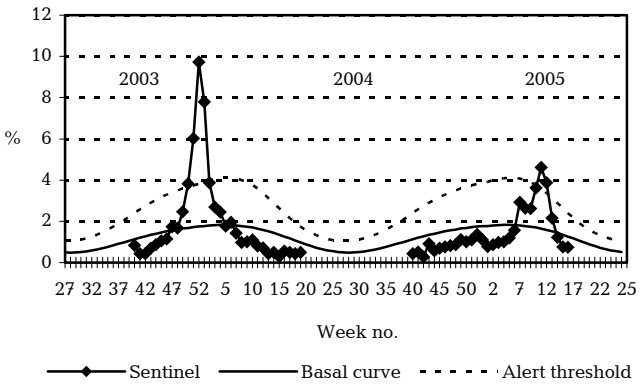
[4] *Serum specimens with pos. complement fixation test*

[5] *Isolated in blood or spinal fluid*

[6] *See also www.germ.dk*

Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2003/2004/2005



Sentinel:	Influenza consultations (as percentage of total consultations)
Basal curve:	Expected frequency of consultations under non-epidemic conditions
Alert threshold:	Possible incipient epidemic

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