EPI-NEWS

NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES

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PREVALENCE OF ESBL-PRODUCING BACTERIA

No. 15, 2010

Enterobacteria such as Escherichia coli and Klebsiella pneumoniae, which produce Extended Spectrum Beta-Lactamases (ESBL), are resistant to ampicillin, cefuroxime, cefotaxime, ceftazidime og ceftriaxone. As ESBL genes are frequently located on plasmids which also carry genes causing resistance to aminoglycosides and fluoroquinolones, treatment options may de facto be reduced to a carbapenem antibiotic. The first nation-wide prevalence study of ESBL-producing E. coli and K. pneumoniae in blood and urine cultures was performed in September-October 2007, EPI-NEWS 11/08. The study demonstrated that these resistant bacteria were well-rooted in Denmark and that occurrence seemed to follow a steeply increasing trend. A follow-up prevalence study was effected in October 2009.

Table 1. Prevalence of Extended Spectrum Beta-Lactamase (ESBL) in E. coli and K. pneumoniae isolated from blood and urine cultures, September-October 2007 and October 2009

Sample type	Period	No. of cultures	E. coli findings	Of these, ESBL (%)	K. pneum. findings	Of these, ESBL (%)
Blood	2007	18259	625	26 (4.2)	160	8 (5.0)
	2009	11523	356	25 (7.0)	89	13 (14.6)
Urine, hosp.	2007 *		6791	157 (2.3)	1078	71 (6.6)
	2009	16536	4004	152 (3.8)	675	78 (11.1)
Urine, GP	2007 *		4966	74 (1.5)	513	14 (2.7)
	2009	12574	3392	74 (2.3)	385	26 (6.8)

*For the 2007-study, no information was provided on the distribution of the in all 47,504 urine cultures performed in hospitals and general practices

Study results
Fourteen of the fifteen Danish microbiology departments participated, and all E. coli, K. pneumoniae and Proteus mirabilis isolates from blood and urine cultures were tested for ESBL-production, Table 1. Based on blood culture results, the prevalence of ESBL in E. coli increased from 4% to 7%, and for K. pneumoniae a significant increase from 5% and up to 15% was observed. Bacteria found in urine samples from general practice as well as hospitals showed significant increases of 50-150% in the prevalence of E. coli and K. pneumoniae. Only two ESBL-producing P. mirabilis isolates were found. No further details will be provided on these.

Epidemiology
ESBL-producing bacteria occur as part of the intestinal flora in hospitalized patients and in otherwise healthy persons in the community. The carrier state is a risk factor for subsequent clinical infection with the same ESBL-producing bacterium. Like other enterobacteria, the bacteria transfer via the faecal-oral transmission route. Infection is furthered by the presence of catheters and other foreign bodies. In non-hospital contexts, ESBL-producing bacteria are primarialy associated with urinary tract infections in the elderly and in patients with underlying conditions. In the hospital setting, however, the bacteria may also cause pneumonia, wound infection and septicaemia. ESBL-producing enterobacteria, particularly K. pneumoniae, have a distinct tendency to cause nosocomial outbreaks.

Interventions
ESBL-producing bacteria are selected by broad-spectrum antibiotics, particularly cephalosporins and fluoroquinolones. During the last decade, the consumption of these antibiotics has increased markedly, EPI-NEWS 47/09. Use of these groups of antibiotics should be limited to the necessary minimum. Hospital outbreaks may be prevented by contact isolation of colonised patients, including emphasis on the importance of good hand hygiene comprising alcohol-based hand disinfectants and frequent cleaning of toilets and bathing facilities with disinfectants. Furthermore, it is essential that colonised/infected patients' infection status be registered in patients' health records and discharge summaries, so that the relevant precautions may be taken in connection with future contacts.
In general practice and in the community, the population should – to the extent possible – be protected against exposure to resistant bacteria and against selection of these by implementation of a strict and rational antibiotics policy. As ESBL-producing bacteria may be acquired via contaminated food, it is important to implement a rational antibiotics policy during food production and to monitor the occurrence of resistant bacteria in food, particularly in imported meat, fruit and vegetables.

Commentary
The increase in the occurrence of ESBL in E. coli and K. pneumoniae observed in the hospital setting as well as in the community is worrying. Infection with ESBL-producing bacteria frequently entails prolonged admission periods with ensuing human and financial costs. The mortality for septicaemia caused by E.coli and K. pneumoniae sensitive to antibiotics is approx. 20%, but this figure may increase 2-3 fold in case of ESBL-producing bacteria. The reason is that detecting resistance takes time and so initiation of relevant antibiotics treatment is delayed correspondingly. Alternatively, empirical treatment on suspicion of septicaemia should be changed to a carbapenem. Carbapenem is the last resort antibiotic to very resistant gram-negative sticks, and we should not expect new and more effective antibiotics to be introduced in the next decade. Furthermore, enterobacteria resistant to carbapenems have already been observed, e.g. in Greece. Consequently, infections will soon occur for which no good treatment options exist. Additionally, shifting empirical treatment to carbapenems will entail considerable costs.
(D.S. Hansen, Department of Clinical Microbiology, Hillerød Hospital, N. Frimodt-Møller, National Center for Antimicrobials and Infection Control, SSI, on behalf of the DANRES workgroup)

CHANGED PNEUMOCOCCAL VACCINE FOR CHILDREN
As from week no. 16, 13-valent Prevenar (PVC13) will be supplied instead of the presently used 7-valent pharmaceutical. Children who have initiated vaccination may switch to PCV13 regardless of the number of vaccinations they have currently received. For further information, please see www.ssi.dk (Danish language).
(Department of Epidemiology)

14 April 2010

Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2010 figures are preliminary)

Table 1	Week 14 2010	Cum. 2010 [1]	Cum. 2009 [1]
AIDS	1	17	7
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	0
Creutzfeldt-Jakob	0	5	2
Diphtheria	0	0	0
Food-borne diseases	3	58	113
of these, infected abroad	1	18	21
Gonorrhoea	9	152	164
Haemorrhagic fever	0	0	0
Hepatitis A	1	11	8
of these, infected abroad	0	3	5
Hepatitis B (acute)	0	10	9
Hepatitis B (chronic)	0	59	63
Hepatitis C (acute)	0	0	2
Hepatitis C (chronic)	0	129	110
HIV	5	70	77
Legionella pneumonia	1	33	29
of these, infected abroad	0	5	3
Leprosy	0	0	0
Leptospirosis	0	0	0
Measles	1	2	9
Meningococcal disease	1	23	31
of these, group B	1	2	9
of these, group C	1	6	3
of these, unspec. + other	1	4	0
Mumps	0	3	3
Neuroborreliosis	1	6	3
Ornithosis	1	4	0
Pertussis (children < 2 years)	1	27	36
Plague	0	0	0
Polio	0	0	0
Pneum. disease, invasive (IPD) [2]	3	49	44
Purulent meningitis			
Haemophilus influenzae	0	0	2
Listeria monocytogenes	0	2	2
Other aethiology	0	3	5
Unknown aethiology	0	0	1
Under registration	2	3	0
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis	0	26	28
of these, infected abroad	0	20	26
Syphilis	6	96	75
Tetanus	0	0	0
Tuberculosis	3	91	113
Typhoid/paratyphoid fever	2	14	6
of these, infected abroad	1	11	5
Typhus exanthematicus	0	0	0
VTEC/HUS	1	36	32
of these, infected abroad	0	8	7

[1] *Cumulative number 2010 and in corresponding period 2009*

[2] *Meningitis, all age groups, invasive pneumococcal disease < 5 years*

Selected laboratory diagnosed infections

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

Table 2	Week 14 2010	Cum. 2010 [3]	Cum. 2009 [3]
Bordetella pertussis (all ages)	3	40	39
Gonococci	10	143	111
of these, females	3	40	25
of these, males	7	103	86
Listeria monocytogenes	2	9	15
Mycoplasma pneumoniae			
Resp. specimens [3]	3	32	24
Serum specimens [4]	0	76	47
Streptococci [5]			
Group A streptococci	3	56	60
Group B streptococci	1	31	27
Group C streptococci	2	12	8
Group G streptococci	4	42	42
S. pneumoniae	26	386	461

Table 3	Week 12 2010	Cum. 2009 [3]	Cum. 2008 [3]
MRSA	8	197	177
Pathogenic int. bacteria [6]			
Campylobacter	54	534	374
S. Enteritidis	2	66	52
S. Typhimurium	10	75	223
Other zoon. salmonella	5	130	154
Yersinia enterocolitica	1	31	45
Verocytotoxin-producing E. coli	1	35	28
Enteropathogenic E. coli	4	40	31
Enterotoxigenic E. coli	6	118	49

[3] *Cumulative number 2010 and in corresponding period 2009*

[4] *Resp. specimens with positive PCR*

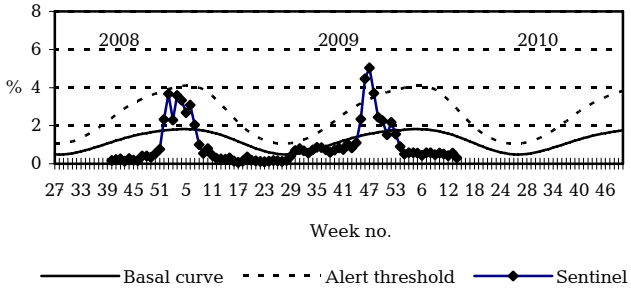
[5] *Serum specimens with pos. complement fixation test*

[6] *Isolated in blood or spinal fluid*

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

Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2008/2009/2010



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