EPI-NEWS

NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES

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ANTIBIOTIC CONSUMPTION AND RESISTANCE 2004/2005

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The annual DANMAP report (Danish Integrated Antimicrobial Resistance Monitoring and Research Programme, www.danmap.org) summarises the Danish consumption of antibiotics used for animals and humans, and follows the development of resistance in bacteria collected from animals, foodstuffs and humans.

Antibiotic consumption in animals

From 2003 to 2004, the total consumption of antibiotics used for production animals increased from 102.5 to 112.5 tonnes. This increase was primarily due to increased consumption in pig production. The consumption of antibiotics used for poultry increased the most, but represented only 0.4% of the total antibiotic consumption.

Resistance incidence in zoonotic bacteria

Salmonella typhimurium was not found in Danish chicken meat in 2004. S. Typhimurium isolates from foreign pork had significantly increased levels of resistance towards several antibiotics compared with isolates from Danish pork. Comparisons of Campylobacter jejuni and C. coli isolates from imported and Danish chicken meat showed a similar pattern and level of resistance towards antibiotics - including ciprofloxacin. Among human infections caused by S. Typhimurium and S. Enteritidis, there was an increased incidence of resistance to ciprofloxacin in infections acquired abroad.

Human antibiotic consumption

As reported in DANMAP 2004, the total consumption of antibiotics continued to increase in 2004 in both primary health care and hospitals. The increase in primary health care was evenly distributed across the various classes of antibiotics. Beta-lactamase-sensitive penicillins (phenoxymethylpenicillin) and penicillins with extended spectrum (e.g. amoxicillin) represented 56% of the total consumption. In hospitals, the total consumption of antibiotics, expressed as DDD (defined daily doses) per 1,000 bed days, has increased by 36% between 1997 and 2004. However, rationalisation and increased hospital activity has increased the number of treated patients and shortened in-hospital stays. Thus, the increased consumption calculated per 1,000 discharged patients in the same period was only 10%.

Figure 1. Consumption of selected antibiotics in primary sector in 2000, expected consumption in 2005 and changes in %. Consumption in DDD (Defined Daily Doses)

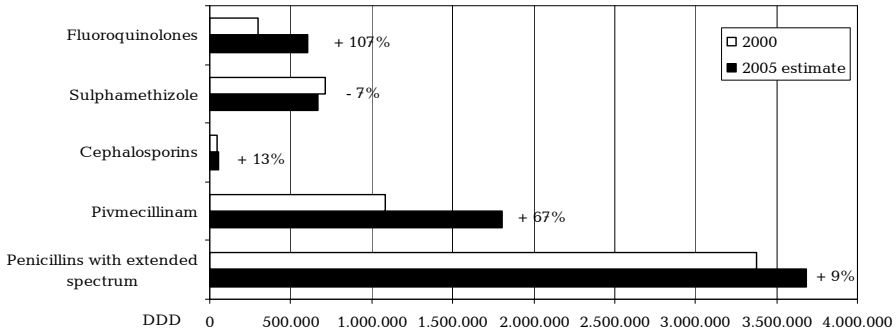
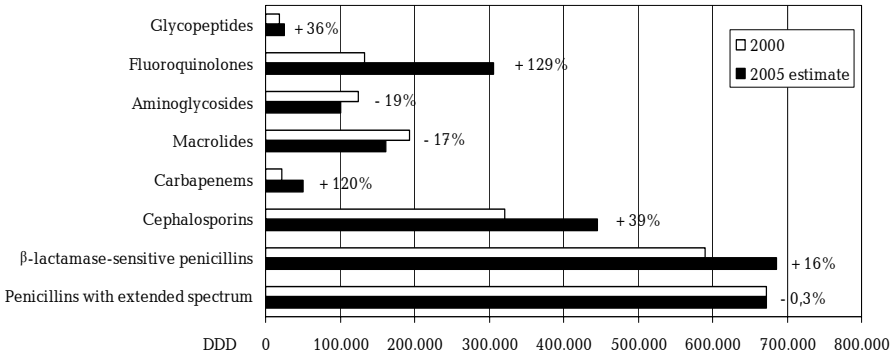


Figure 2. Consumption of selected antibiotics in hospitals in 2000, expected consumption in 2005 and changes in %. Consumption in DDD (Defined Daily Doses)



As shown in figure 1 and figure 2, consumption of fluoroquinolones has more than doubled between 2000 and 2005, in both primary health care and hospitals. The 2005 consumption is estimated on the basis of the consumption in the first seven months of the year. In hospitals, the consumption of antibiotics is increasing due to a shift towards consumption of newer broad-spectrum antibiotics (cephalosporins, fluoroquinolones and carbapenems) at the expense of penicillins with extended spectrum, macrolides and aminoglycosides, figure 2.

Development of resistance in primary sector and hospitals

Resistance to ciprofloxacin in E. coli urine isolates from primary health care increased significantly from 1.9% in 2003 to 2.9% in 2004, and the incidence of resistance to sulfonamides and ampicillin in 2004 remained high (> 30% resistance in all counties). In hospitals, the number of ciprofloxacin-resistant E. coli urine isolates increased from 2.3% in 2003 to 3.1% in 2004. The number of cephalosporin-resistant invasive E. coli isolates increased to 2.7%. In 2004, resistance towards penicillins and macrolides remained low in Streptococcus pneumoniae (2% and 3.7%) and Gr. A streptococcus (0%, and 1.6%). Infections caused by methicillin-resistant Staphylococcus aureus (MRSA) nearly doubled in 2004 to 411 cases, of which most (90%) were acquired in Denmark.

Comments

The consumption of antibiotics for animals and humans is still increasing. In hospitals, the consumption of newer broad-spectrum antibiotics is increasing. This is likely to be in favour of the empirical treatment of patients. However, a continued increase in consumption will lead to increasing resistance to these antibiotics. In primary health care, the consumption of ciprofloxacin has been followed closely, EPI-NEWS 41/04. The increased E. coli resistance towards ciprofloxacin seen in 2004 is expected to be further increased in 2005 due to the increased consumption seen in the first half of 2005.

(C.T. Brandt, L. Bagger-Skjøt, A. M. Hammerum, N. Frimodt-Møller, D.L. Monnet, Dept. of Antibiotic Resistance and Hospital Hygiene)

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Individually notifiable diseases

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

Table 1	Week 42 2005	Cum. 2005 [1]	Cum. 2004 [1]
AIDS	0	48	37
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	1
Creutzfeldt-Jakob	0	2	7
Diphtheria	0	0	0
Food-borne diseases	12	449	518
of these, infected abroad	2	109	84
Gonorrhoea	11	412	278
Haemorrhagic fever	0	0	0
Hepatitis A	1	54	193
of these, infected abroad	0	17	54
Hepatitis B (acute)	0	30	35
Hepatitis B (chronic)	1	113	109
Hepatitis C (acute)	0	1	2
Hepatitis C (chronic)	0	250	255
HIV	5	216	247
Legionella pneumonia	3	101	88
of these, infected abroad	1	39	27
Leprosy	0	0	0
Leptospirosis	0	9	7
Measles	0	2	0
Meningococcal disease	0	73	80
of these, group B	0	36	44
of these, group C	0	19	11
of these, unspec. + other	0	18	25
Mumps	0	7	1
Neuroborreliosis	1	68	106
Ornithosis	1	18	5
Pertussis (children < 2 years)	2	130	184
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	1	3
Listeria monocytogenes	0	1	2
Streptococcus pneumoniae	0	89	81
Other aethiology	0	13	6
Unknown aethiology	0	12	12
Under registration	7	27	-
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis	2	88	66
of these, infected abroad	2	70	55
Syphilis	2	107	109
Tetanus	0	2	0
Tuberculosis	13	369	342
Typhoid/paratyphoid fever	0	30	21
of these, infected abroad	0	28	19
Typhus exanthematicus	0	0	0
VTEC/HUS	0	131	124
of these, infected abroad	0	46	24

[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 42 2005	Cum. 2005 [2]	Cum. 2004 [2]
Bordetella pertussis			
(all ages)	7	425	791
Gonococci	8	368	317
of these, females	0	39	41
of these, males	8	329	276
Listeria monocytogenes	0	31	29
Mycoplasma pneumoniae			
Resp. specimens [3]	16	785	223
Serum specimens [4]	10	630	312
Streptococci [5]			
Group A streptococci	0	88	100
Group B streptococci	0	63	67
Group C streptococci	0	19	18
Group G streptococci	0	94	86
S. pneumoniae	16	893	977
Table 3	**Week 40 2005**	**Cum. 2005 [2]**	**Cum. 2004 [2]**
Pathogenic int. bacteria [6]			
Campylobacter	65	2,933	3,029
S. Enteritidis	18	528	416
S. Typhimurium	16	429	388
Other zoon. salmonella	14	466	409
Yersinia enterocolitica	7	190	179

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

[3] *Resp. specimens with positive PCR*

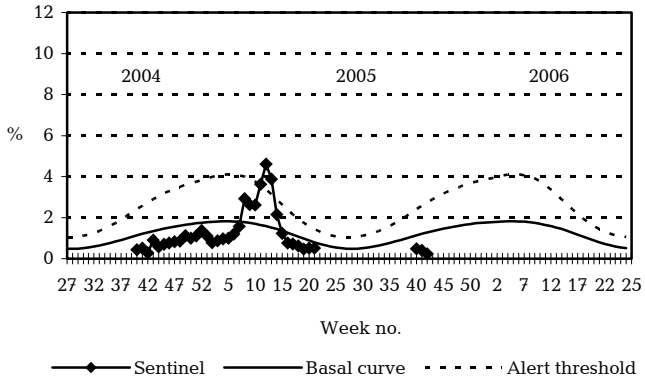
[4] *Serum specimens with pos. complement fixation test*

[5] *Isolated in blood or spinal fluid*

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

Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2004/2005/2006



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

26 October 2005