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BATH WATER INFECTIONS AND MARINE BACTERIA

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Marine bacteria infections, particularly Vibrio vulnificus, have previously attracted considerable attention because a quick dip or a fishing trip can cause serious disease.

Early warning in Denmark
In 1994 eleven persons were admitted to hospital with Vibrio vulnificus infection caused by seawater contact in connection with bathing or fishing, EPI-NEWS 34/94. The former Danish Environmental Protection Agency (now Danish Agency for Spatial and Environmental Planning) therefore recommended that Danish municipalities analyse bacterial occurrence at bath water temperatures ≥ 20°C.
In the period 2005-2007, the Agency for Spatial and Environmental Planning in cooperation with the DHI (previously the Danish Hydrology Institute) tried to develop an early warning model for Vibrio vulnificus. The ambition was to establish operational threshold values based on the number of bacteria in bath water samples. However, the number of bacteria measured varied unpredictably from day to day, and the time span from sampling to test result impeded the establishment of an effective early warning mechanism. Furthermore, neither theory nor practice provided a basis for the establishment of a threshold value. This attempt to establish early warning was therefore abandoned.
In 2007, a mathematical model from the DHI which was based on temperature and salinity yielded promising results. The model confirmed that combined low salinity and high temperatures lead to an increase in marine bacteria growth. However, in 2008, the Agency for Spatial and Environmental Planning, the National Board of Health and the DHI established that the modelled levels and the specific geographically observed levels at the beaches were uncorrelated. The model was based on too large fields and only covered open waters, whereas the conditions in shallow waters such as smaller bays and fiords could not be described adequately.
As few persons bathe in open waters with water depths ≥ 3 meters, this model was also inadequate for an early warning system targeting sea bathers.

Conclusion and recommendation
It has not been possible to develop an expedient early warning system aimed at reducing Vibrio vulnificus bathing risk in Denmark. Furthermore, it has not been possible to identify any such system anywhere else. Physicians should therefore inform immunocomprised patients of the slightly increased risk connected with bathing when water temperatures have equalled or exceeded 15°C for more than a week in low salinity areas such as the Baltic Sea, smaller bays and inlets or ≥ 20°C in the remaining parts of Denmark. Immunocomprised persons are recommended to consult a physician if they present with fever or major skin or ear infection in the days following bathing or after skin rupture injuries in connection with fishing/beach activities. More information (Danish language) on bath water bacteria can be found at www.sst.dk, www.blst.dk, www.ssi.dk www.sofartsstyrelsen.dk www.foedevarestyrelsen.dk, www.at.dk.
(K. Kristiansen, MOH Copenhagen, Danish National Board of Health, L. Bagge, Agency for Spatial and Environmental Planning)

MARINE BACTERIA
The Vibrio (V.) and Shewanella (S.) species occur naturally in seawater. Among the more than 80 known V. species, only a limited number are known to be pathogenic. The most familiar ones are V. cholerae O1 and O139 which are toxin-producing and cause cholera; these should not be mistaken for the non-toxin-producing V. cholerae species which occur in Danish waters.
The V. alginolyticus, V. parahaemolyticus og V. vulnificus, which require a saline environment, are the most frequently identified species in Danish patients. Shewanella algae and S. putrefaciens are common in Danish waters and known as decomposition bacteria in fish. The majority of human infections are caused by S. algae.

Occurrence in Denmark
Marine bacteria infection is not notifiable in Denmark and consequently, a full overview of the occurrence is not available.
Previously, 0-13 annual cases of V. vulnificus have been reported along with sporadic findings of V. alginolyticus, V. parahaemolyticus and S. algae in blood cultures from immunodeficient patients, EPI-NEWS 26-32/2006.

Transmission
Marine bacteria transmission occurs in connection with direct or indirect contact with seawater.
In Denmark, transmission most frequently occurs via wounds or cuts in connection with bathing or through intact skin in connection with skin rupture accidents with fish hooks, etc. In other countries, the predominant transmission mode is ingestion of raw fish or shellfish.

Clinical picture
In Denmark, the most frequently occurring symptoms are wound and ear infections caused by S. algae, V. alginolyticus and V. parahaemolyticus. These infections are benign and generally do not require systemic antibiotic treatment.
In some cases, more serious skin infections occur. These infections frequently present as reddening, swelling and haemorrhagic bullae and secondary spreading to the blood stream. The most severe infections are V. vilnificus which is associated with a considerable mortality. Primary spreading to the blood stream with no objective infection focus is most frequently caused by V. vulnificus, V. parahaemolyticus and S. algae. Such spreading is almost exclusively seen in patients with serious underlying conditions.
Gastrointestinal infection including diarrhoea and possible secondary spreading to the blood stream with toxin-producing V. cholerae and V. parahaemolyticus is almost exclusively seen in subtropical/tropical areas. Rare Danish cases are usually associated with transmission in connection with travelling abroad.

Diagnosis and treatment
It is essential that information concerning seawater exposure be included when samples are forwarded to the clinical microbiology departments, which – particularly in the summertime – should be aware of oxidase positive, Gram-negative sticks in wound swabs, which frequently comprise mixed flora. Particularly, patients with chronic wounds, immunodeficiencies and impaired general health are at risk of contracting serious disease that may require hospitalisation. In severe wound infection cases, immediate surgical and antibiotic treatment may be needed.
(H. Holt, Clinical Microbiology Dept., Odense University Hospital, S. Glismann, Dept. of Epidemiology)

7 May 2008

Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2008 figures are preliminary)

Table 1	Week 18 2008	Cum. 2008 [1]	Cum. 2007 [1]
AIDS	0	11	22
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	0
Creutzfeldt-Jakob	0	4	2
Diphtheria	0	0	0
Food-borne diseases	16	108	166
of these, infected abroad	0	24	31
Gonorrhoea	2	121	120
Haemorrhagic fever	0	0	0
Hepatitis A	0	16	11
of these, infected abroad	0	6	5
Hepatitis B (acute)	0	4	7
Hepatitis B (chronic)	0	57	93
Hepatitis C (acute)	0	4	2
Hepatitis C (chronic)	0	125	102
HIV	9	87	102
Legionella pneumonia	1	37	30
of these, infected abroad	0	12	4
Leprosy	0	0	0
Leptospirosis	0	2	6
Measles	0	6	1
Meningococcal disease	0	22	28
of these, group B	0	10	15
of these, group C	0	4	7
of these, unspec. + other	0	8	6
Mumps	3	17	3
Neuroborreliosis	0	19	26
Ornithosis	0	1	1
Pertussis (children < 2 years)	2	36	27
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	0	1
Listeria monocytogenes	0	1	5
Streptococcus pneumoniae	0	36	46
Other aethiology	0	12	6
Unknown aethiology	0	8	8
Under registration	4	15	-
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis	3	24	20
of these, infected abroad	0	19	12
Syphilis	1	35	30
Tetanus	0	0	0
Tuberculosis	11	141	132
Typhoid/paratyphoid fever	0	12	4
of these, infected abroad	0	10	4
Typhus exanthematicus	0	0	1
VTEC/HUS	4	42	59
of these, infected abroad	0	13	22

[1] *Cumulative number 2008 and in corresponding period 2007*

Selected laboratory diagnosed infections

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

Table 2	Week 18 2008	Cum. 2008 [2]	Cum. 2007 [2]
Bordetella pertussis (all ages)	1	43	47
Gonococci	1	122	111
of these, females	0	24	15
of these, males	1	98	96
Listeria monocytogenes	0	15	19
Mycoplasma pneumoniae			
Resp. specimens [3]	0	41	223
Serum specimens [4]	0	48	249
Streptococci [5]			
Group A streptococci	3	61	55
Group B streptococci	2	39	31
Group C streptococci	0	4	7
Group G streptococci	1	39	43
S. pneumoniae	18	469	487
Table 3	**Week 16 2008**	**Cum. 2008 [2]**	**Cum. 2007 [2]**
MRSA	9	166	-
Pathogenic int. bacteria [6]			
Campylobacter	37	531	679
S. Enteritidis	3	84	96
S. Typhimurium	18	162	90
Other zoon. salmonella	11	232	173
Yersinia enterocolitica	8	79	85
Verocytotoxin-producing E. coli	1	39	56
Enteropathogenic E. coli	4	26	41
Enterotoxigenic E. coli	2	91	49

[2] *Cumulative number 2008 and in corresponding period 2007*

[3] *Resp. specimens with positive PCR*

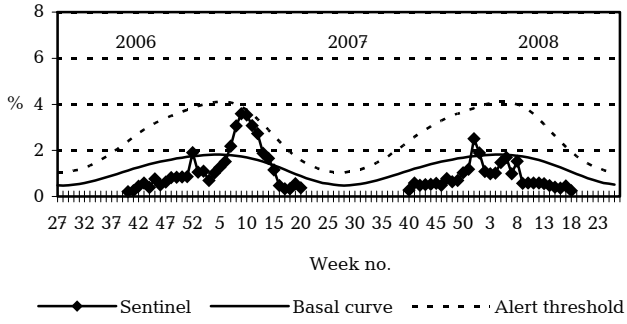
[4] *Serum specimens with pos. complement fixation test*

[5] *Isolated in blood or spinal fluid*

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

Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2006/2007/2008



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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