



INFECTIONS WITH SEAWATER BACTERIA

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The warm Danish summer with high seawater temperatures has caused a number of infections with seawater bacteria of the genus *Vibrio* (*V.*) and *Shewanella* (*S.*). Moreover, four persons have fallen ill from infections with a *Vibrio* species following bathing in the Baltic Sea.

Incidence

The *Vibrio* and *Shewanella* species are naturally occurring seawater bacteria. Their incidence depends on the contents of salts and nutrients and on the water temperature. The highest incidence is thus found in those areas where the water temperature has been above 20° C for a long period. Subtropical and tropical areas are therefore also experiencing the highest incidence levels. In temperate areas like Denmark, the risk of infection peaks during very warm summers like this year.

Vibrio species

Among the more than 70 known *Vibrio* species, 12 may cause the outbreak of disease among humans. It is important to distinguish the toxin-producing *V. cholerae* O1 and O139 from the non-toxin-producing *V. cholerae*. The former give rise to cholera disease, which is mainly known from developing countries; see www.ssi.dk/sw1247.asp, whereas the latter may be found in seawater and can lead to infection, e.g. with the skin as the portal of entry.

In Denmark the most commonly found species in man are *V. alginolyticus*, *V. parahaemolyticus* and *V. vulnificus*.

Shewanella species

S. algae and *S. putrefaciens* are common bacteria in Danish seawaters and are known as putrefaction bacteria in fish. Most human infections are caused by *S. algae*, which may give rise to ear and wound infections, possibly accompanied by secondary bacteraemia.

Infection

Infection with seawater bacteria takes place through direct contact via non-intact skin or by ingestion of shellfish, most commonly oysters insufficiently heated during cooking.

Table 1. Number of positive findings related to seawater bacteria in human samples analysed at Danish clinical departments of microbiology, 2006

Bacteria species	Number of findings				Total
	Wound	Ear	Blood	Not indicated (other sample material)	
<i>V. alginolyticus</i>	2	4	1	0	7
<i>V. parahaemolyticus</i>	3	2	1	(1)	7
<i>V. vulnificus</i>	0	0	1	0	1
<i>V. cholerae</i> (non-toxin-producing)	0	0	0	0	0
<i>S. arter</i>	9	14	1	2	26
Total	14	20	4	3	41

Clinical picture

In Denmark the most commonly seen manifestations are infections of wounds, mucosal membranes and ears, possibly with secondary bacteraemia.

V. alginolyticus, *V. parahaemolyticus* and *S. species* are the most common bacteria causing benign ear and wound infections not requiring antibiotic treatment.

V. vulnificus may cause serious infection and cellulitis requiring emergency surgery and antibiotic treatment.

Primary bacteraemia without demonstrable infection focus is most commonly caused by *V. vulnificus*, *V. parahaemolyticus* or non-toxin-producing *V. cholerae*.

Primary bacteraemia is almost exclusively seen in immunosuppressed patients with serious underlying diseases.

Gastrointestinal infection with diarrhoea and potential secondary bacteraemia with toxin-producing *V. cholerae* (choleraic disease) and *V. parahaemolyticus* are almost exclusively seen in subtropical and tropical areas. In Denmark such disease is very rare and it is mostly a sequelae of infection acquired during stays abroad.

Treatment

Patients with chronic wounds, depressed immune defence and impaired general health are at particular risk of acquiring serious disease that may require hospitalisation. Serious wound infections may require debridement and antibiotic treatment.

Prevalence in Denmark

Infection with seawater bacteria is not a notifiable disease in Denmark.

An overall review of the prevalence of such disease is therefore not available.

However, there have been previous notifications of infections with the highly pathogenic *V. vulnificus* with two cases being reported during 1989-93 and 13 cases in 1994, EPI-NEWS 34/94.

An enquiry to the Danish departments of clinical microbiology shows that cases diagnosed during 2006 have mainly been skin and ear infections with *V. alginolyticus*, *V. parahaemolyticus* and *S. species*, [Table 1](#).

Two children with general impairment of their immune defence have been admitted due to infection with *V. alginolyticus* and *V. parahaemolyticus*, respectively. One adult patient was admitted with a serious infection with *V. vulnificus*. Another two adult patients have been admitted with fever and wound infection; one had bacteraemia due *S. species*.

Comments

Sporadic infection with seawater bacteria is known to happen during warm summer periods in Denmark. Attention should be drawn to the fact that warm seawater may give rise to infection with *V. vulnificus*, which may have a very serious course in patients with impaired immune defence, notably in patients with chronic liver disease and malignant blood diseases.

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The first review of notifications of individual notifiable diseases and selected confirmed cases of infections after the summer holidays will appear in EPI-NEWS No. 33, 2006.
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