



European Monitoring Centre
for Drugs and Drug Addiction



**Joint ECDC and EMCDDA Threat Assessment
Anthrax outbreak among drug users, Scotland and Germany
Update: 15 January 2010**

SOURCE AND DATE OF REQUEST

Update of the threat assessment of 22 December 2009 on anthrax among drug users in Scotland (cf. EWRS from the UK on 18 December 2009), following the report of an additional case by Germany (cf. EWRS on 12 January 2010)

PUBLIC HEALTH ISSUE

Anthrax among injecting drug users and risk of new infections through contaminated product

CONSULTED EXPERTS

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DISEASE BACKGROUND INFORMATION

Anthrax is an acute infectious disease caused by the Gram-positive spore-forming bacterium *Bacillus anthracis*. Anthrax most commonly occurs in wild and domestic animals like cattle, sheep, goats, camels, and is endemic in a number of mostly agricultural countries in South and Central America, Southern and Eastern Europe, Asia, Africa, the Caribbean, and the Middle-East. In most industrialized countries, anthrax is a rare disease, and infection in humans is usually due to occupational exposure to infected animals or their products.

Anthrax infection is classically described as occurring in three forms: cutaneous (about 95% of all cases occurring), pulmonary with severe atypical pneumonia, and

gastrointestinal; although there has also been one report (from Norway) of “injection anthrax” which had clinical presentation. Symptoms of disease vary depending on how the disease was contracted. The incubation period is usually 1 to 7 days, but can be prolonged to up to 60 days. Untreated, the case fatality rates range from 5-20% in cutaneous anthrax, to more than 85% in pulmonary and gastrointestinal anthrax. Antibiotic treatment is effective and can prevent most deaths in cutaneous cases; however, mortality in pulmonary and gastrointestinal cases remains high even with treatment ⁽¹⁾.

B. anthracis spores can live in the soil for many years, and humans can become infected with anthrax by handling products from infected animals or by inhaling anthrax spores from contaminated animal products. Anthrax infection can also be acquired by eating undercooked meat from infected animals, or, as has been reported, by injecting contaminated drugs ⁽²⁾. The risk of person-to-person transmission is extremely low.

B. anthracis is listed as Category A pathogen in the list of bioterrorism agents of the US CDC, and belongs to the group of “very high threat” agents of the EU. Deliberate release of spores may also lead to infection in humans.

EVENT BACKGROUND INFORMATION

Anthrax cases in Scotland, UK

On 18 December 2009, the UK issued a EWRS message reporting an outbreak of anthrax among injecting drug users (IDU) in Scotland. Two cases from Glasgow, one of them fatal, were confirmed as having anthrax infections, and 3 additional possible cases were under investigation. Both confirmed cases developed illness in the first week of December ⁽³⁾.

On 11 January 2010, the Health Protection Scotland updated the information and reported 14 confirmed cases (10 males and 4 females), including 7 fatal cases ⁽⁴⁾. The mean age is 38 year old for the confirmed cases and 42 year old for the fatal cases. The only link so far among all cases is being a heroin user. It should be noted that one of the fatal case only reported smoking and snorting heroin. Post mortem physical inspection did not show traces of injections or soft tissue lesions, which supports a possible contamination by inhalation.

As of today, all cases reported in Scotland are clustered over 5 weeks, with the first case admitted to the hospital on 7 December 2009 and the most recent case admitted on 6 January 2010 (and died within 36 hours).

The genotyping of the isolates shows that they are identical which strongly suggests that all the cases have been infected by a common source.

In Scotland and England, information was sent out to hospitals, GPs, emergency departments, microbiologists, and drug services to raise awareness and to request

that cases of severe soft tissue infection or sepsis affecting an injecting drug user are reported to their local public health authority.

Samples of heroin are currently being tested in Scotland in order to identify a possible contaminated batch and to differentiate between contamination of heroin and contamination of the cutting agent mixed with heroin. So far, all samples have been tested negative for anthrax.

Anthrax surveillance in Scotland is based on voluntary laboratory reports. Only one case of anthrax has been reported in Scotland since 1987, in 2006, in a person who handled and played drums made from animal hides ⁽⁵⁾.

Anthrax case in Germany

On 12 January 2010, Germany issued a EWRS message reporting a fatal case of anthrax in a 42 year old male injecting drug user, who presented oedema and swelling of the leg after intravenous popliteal (area behind the knee joint) drug injection (probably heroin). The patient was hospitalized on 6 December 2009 and despite antibiotic treatment he died on 13 December. Death occurred due to multi-organ failure after necrotizing fasciitis (severe infection and destruction of soft tissue). Currently, it is not clear whether there is a link to the anthrax outbreak among injecting drug users in Scotland. As far as known, the deceased has no travel history to Scotland ⁽⁶⁾.

The Robert Koch Institute, in collaboration with the respective local and regional health authorities in Aachen district, Northrhine-Westphalia, is currently investigating the case. An epidemiological investigation, which includes distribution of information to hospitals, GPs, emergency departments, microbiologists and low threshold facilities was launched in order to raise awareness, gain more thorough information and search for suspected cases.

Actions by European partners

The European early warning network of the EMCDDA has been alerted of the cases in Scotland and the death in Germany and has strengthened surveillance to detect possible additional cases in Europe.

EUROPOL has been informed and is conducting enquiries in support of the EU Member States national authorities in an attempt to gather any information that may assist in identifying a possible source of contamination.

ECDC THREAT ASSESSMENT FOR THE EU

The frequent occurrence of skin and soft tissue infections in IDU is a well-known phenomenon ^(7,8). However, anthrax is a rare cause, and few cases have been described so far. In 2000, one single case of anthrax was diagnosed in a heroin user in Norway, but no further cases were detected ⁽²⁾. Therefore, the occurrence of 15 confirmed cases, including 8 deaths in a 5 week period is unusual and unexpected.

The occurrence of a new fatal case in Germany raises the possibility of an epidemiological link with the cases in Scotland. The cluster of 14 confirmed cases of *B. anthracis* and genotyping in Scotland among heroin users strongly suggests that contaminated heroin or contaminated cutting agent mixed with the heroin may be a common source and vehicle of infection. So far, no other link than injecting drugs has been demonstrated between the German fatal case and the previously reported Scottish cases. Further investigations may provide evidence of a possible link.

Considering the complex international distribution chain of heroin, and the clustering in time of cases in Scotland and Germany, the exposure to a contaminated batch of heroin distributed in several EU Member States is possible. However, it is still also possible that the German case is due to a small amount of heroin that was bought in Scotland either by himself or someone else, in which case the majority of the batch might still remain in Scotland (as suggested by the distribution of cases) and possibly other countries than UK/Scotland and Germany might not be affected. Investigation of the origin of the drug supply and distribution channels, if possible, may help to identify countries potentially exposed to a contaminated batch of heroin. Although the peak of reported cases has been in the week of 20 December, it is likely that the risk of exposure is still present as the last reported case in Scotland had a recent onset date.

At this time, ECDC has not been alerted about possible deliberate contamination of heroin or cutting agents with *Bacillus anthracis*. Consequently, with the information available at this point in time, accidental contamination seems the most plausible explanation to these incidents.

As anthrax has rarely been associated with severe infection among drug users, clinicians may not consider anthrax in the differential diagnosis of severe infections in this population and consequently may result in undiagnosed cases. This highlights the importance of clinical awareness in health care settings of the risk of injection-related infection with rare pathogens among the IDU population.

CONCLUSIONS

Based on current information, it is probable, although not confirmed, that the recent outbreak in Scotland and the fatal case in Germany are linked through exposure to a batch of heroin contaminated by *B. anthracis*. The geographical distribution of the

contaminated batch is unknown at this time. The risk of exposure for heroin users in these and other countries is still present.

Therefore, it is likely that additional cases will still be identified in the near future, in the UK and potentially in Germany and other Member States.

As discussed on 14 January during a teleconference of EWRS national focal points, the following measures were suggested:

- Increase awareness in hospitals and other health care settings, including drug services, to support surveillance efforts, and to provide information on the distribution of the contaminated products;
- Compare genotype of isolates of cases in different countries to confirm a link among cases as well as with genotypes found in the wild;
- Exchange among Member States documents useful for investigation and control, such case definitions, educational material, investigation questionnaires, protocols for treatment and documents useful to develop a strategy to address communication among vulnerable groups;
- Continue forensic investigations at the National and European level to identify contaminated batches of heroin and limit the occurrence of additional anthrax cases.

ECDC remains available to facilitate the coordination of the epidemiological investigation among affected Member States. In addition, EMCDDA and ECDC collaborate to facilitate the information exchange with the drugs sector.

CONTACTS

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