Toxigenic *Corynebacterium ulcerans* isolated from a health care worker with exudative otitis externa and his pet dog

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Abstract

Emerging toxigenic *Corynebacterium ulcerans* causes both wound infections and classical respiratory diphtheria in humans. We identified identical toxigenic *C. ulcerans* isolates from the external ear canal of a man with otitis externa and from a throat swab taken from his dog. We did not find evidence for person-to-person transmission in tested close contact persons. We recommend implementation of statutory notification of all toxigenic *Corynebacterium* spp. – as specified by ECDC – in Germany and guidance on investigation of potential animal reservoirs to reduce the risk of infection in the population.

Case report- part 1

previously healthy 55-year-old male health-care worker (HCW)

d0: symptoms & clinical findings (private practitioner)

- productive bronchitis, treated with oral cefodoxin for 3 d

d42: symptoms & clinical findings (ENT specialist)

- bilateral otitis externa, treated with topical cefpodoxime
- swab taken from left ear canal

Microbiology

toxin producing *Corynebacterium ulcerans*

- API Coryne code 0111326 and MALDI-TOF MS (>2.500)
- sensitive against penicillin G and erythromycin
- toxigenicity: real-time PCR pos. and modified Elek test (weakly pos.)
- MLST: ST 332 (http://pubmlst.org/cdiphtheriae/)

Case report- part 2: Follow up

- switch to oral doxycycline
- notification of the local Public Health Authority (PHA)
- no anamnestic vaccination against diphtheria in contrast to German childhood vaccination recommendations

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Public Health Management

Index case:

- home isolation
- vaccination counselling and offer → denied by the patient
- 3 negative control ear and throat swabs after 4 days of antibiotic treatment → re-admission to work
- no secondary cases

Contact persons:

- household contact 1: patient's partner, unvaccinated HCW with contact to immunosuppressed patients
  - oral clarithromycin prophylaxis for 7 d
  - work ban until 3 consecutive throat swabs tested negative
- household contact 2: patient´s child, partially vaccinated
  - oral clarithromycin prophylaxis for 14 d
  - control: 3 consecutive throat swabs tested negative
- 28 persons with close contact to the index patient during health care procedures in the 10 days before work ban:
  - informed of their exposure and advised to self-monitor
  - throat swabs of all 28 negative for *Corynebacterium* spp.
  - recommandation to vaccine unvaccinated contacts

Source tracing:

- no history of foreign travel, farm visits or consumption of unpasteurised dairy products
- owns two dogs and one cat
- throat swab of one of the dogs: toxigenic *C. ulcerans*
  - identical ABR profile, API Coryne code and toxigenicity features as human isolate
- MLST confirmed clonal identity (ST 332)
- tx of dog: one course of amoxicillin and two courses of marbofloxacin, but still positive for *C. ulcerans* in control swabs

Conclusions

- *C. ulcerans* animal-to-human transmission most likely
- although *C. ulcerans* human-to-human is considered to be only extremely rare, work ban was established for both HCWs with close contact to immunosuppressed patients
- notification of all toxigenic *Corynebacterium* spp. (incl. *C. ulcerans*) should be considered

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