Q fever cluster in the tourist Vineyard of Lavaux

Background
Q fever (Coxiella burnetii)
- Acute infection:
  - symptomatic in 40% of cases
  - flu-like illness, acute hepatitis, interstitial pneumonia
  - 5% hospitalization
- Widespread zoonosis
- Domestic animals (cattle, sheep and goats)
- Inhalation of aerosolized particles shed from infected animals

Importance of the wind in the epidemiology
Acute Q fever: nb of cases

Background
Q fever: Low endemicity in Switzerland
- Incidence of 0.15 cases per 100’000 inhabitants (about 10-12 infections per year)
- No mandatory reports to public authority since 1999
- In animals: 60-80 yearly cases

Cluster
- Between February and May 2012:
  - Cluster of 10 human cases of acute Q fever
    - prolonged fever (>2 weeks)
    - hepatitis (2 biopsy proven granulomatous hepatitis)
    - 1 case of vertebral ostomyelitis
  - Diagnosis
    - 10 positive serology
      including 3 seroconversions
    - 3 positive C. burnetii PCR:
      1 liver, 1 bone, 1 blood

Method
Epidemiological investigations
- Patients interviews to identify exposure risk factors and possible outbreak source
- Public alert to physicians
- Report of new cases to public health authorities
- Screening of all blood donors (Coxiella burnetii PCR)
Veterinary investigations
- Environmental examination for C. burnetii PCR of possible outbreak source
- Vaginal swab for C. burnetii PCR and paired serology in random samples of 5% of all suspected animals
Results

- Epidemiological investigations
  - all patients living (n=5) or walking (n=5) in the Lavaux
  - 5 cases had contact with a sheep farm
  - 2 sheep abortions occurred in this farm (1000 sheep)

Results -2

- Veterinary investigations (June and July 2012)
  - C. burnetii real-time PCR positive in all 13 environmental samples tested (7 dust and 6 manure)
  - 52 sheep randomly selected (5% of 1000 animals)
    - 43% positive for C. burnetii real-time PCR on vaginal swabs
    - 30% positive by ELISA for C. burnetii
    - 71% positive by ELISA or positive real-time PCR

Mitigations measures

- Public alert
  - 4 additional human cases; all from July to August 2012

- Screening of all blood donors
  - 1345 blood donors tested, all negative by C. burnetii PCR

- Veterinarian measures to avoid new human cases
  - movement restriction of all sheep
  - hygiene measure in farm
  - extensive vaccination of sheep flock

Conclusion -1

- Active early measures taken may have been sufficient to avoid a much larger outbreak
  - Public alert including reports to public authorities
  - Mitigations measures to avoid animal-human contact

- Close follow-up of human cases to identify chronic Q fever is necessary
  - 1-5% progress into chronic Q fever

Conclusion -2

- Close collaboration between
  - Public health authorities
  - Human medicine
  - Veterinary medicine
  - Diagnostic microbiology
  - “one” health paradigm

Questions

1. When to alert public health authorities?
2. Differential diagnosis of Coxiella liver infection?
3. Proportion of undiagnosed cases?
4. How to communicate during an outbreak?
5. How to search for subsequent endovascular infections?
6. Should we test blood donors?
7. How to test 150 blood donors per day during summer holidays?
8. …
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