

Q-FEVER

[Query fever, Balkan influenza, Balkan grippe, pneumorickettsiosis, abattoir fever]

SPECIES: Sheep primary lab threat, but other animals also possible

AGENT: *Coxiella burnetii* Multiplies only in living cells. Stains red with Gimenez & Macchiavello stains and purple with Giemsa. Infections in lab workers have been recognized for many years. Serious laboratory hazard in research facilities where infected "asymptomatic" ewes are used for projects.

RESERVOIR AND INCIDENCE: Found worldwide in wild and domestic animals in two self-perpetuating cycles: 1. Wild animals, with numerous tick hosts 2. Domestic animals - sheep, goats, cattle. Widespread in sheep in the U.S. Dogs, cats, and chickens can also be infected. Enzootic infection among domestic animals is the main reservoir of infection for humans.

TRANSMISSION: Organism shed in urine, feces, milk, and especially birth products of domestic ungulates that generally do not show clinical disease (usually sheep and goats). Organism is resistant to drying and can persist for months while providing extensive environmental contamination. **Aerosol is a major means of transmission. Contact with infected tissues: placenta of the infected ewe contains 10⁹ organisms per gram of tissue. Amniotic and fetal tissues are highly infective. Soiled linen may infect personnel in the laundry. One organism is considered to be enough to cause infection in humans. Ingestion.**

DISEASE IN MAN: Two weeks to one month incubation. Febrile illness or Subacute endocarditis. No skin eruption or rash, which distinguishes it from other Rickettsial species infections. Severe frontal headache with retro-orbital pain, profuse sweating, myalgia, and nausea. Pulmonary involvement in half the cases. Asymptomatic in many cases. Most cases resolve in two weeks but may be protracted or relapsing in the elderly. Chronic endocarditis, particularly in persons with preexisting valvular disease, is difficult to treat and the case fatality rate may be as high as 60%.

DIAGNOSIS: Leukopenia with a diagnostic rise in specific CF antibodies to *Coxiella* phase 2. The Weil-Felix test (a test specific for typhus and other Rickettsial diseases) is negative. Liver function tests are often abnormal. In Q fever endocarditis, there is a titer of 1:200 or more by CF or IFA with phase 1 antigen. Isolation of the organism from blood or sputum is rarely attempted due to zoonotic concerns.

TREATMENT: Treatment with tetracyclines can suppress symptoms and shorten the clinical course but does not always eradicate the infection. Even in untreated patients, the mortality rate is usually low, except with endocarditis. Treatment of endocarditis consists of protracted (often for years) of antibiotic therapy; valves often need replacement.

PREVENTION/CONTROL: Use male or nonpregnant female sheep for research, when possible. Q-Fever free sheep - limited practicality because requires intense surveillance program and frequent testing. Also, serologic status is not a useful indicator of whether the animal is shedding virus. Personnel education and control. Physical separation of infected animals from humans are current methods of control. Restrictions on movement of animals within the facility (with considerations of air handling). Label all potentially infected material and sterilize or disinfect it. Protective clothing, masks, gloves, & shoe covers. Intensive medical surveillance and health education program. Treatment of acute disease in humans with tetracycline. Experimental vaccine for sheep has shown promise. Delayed hypersensitivity skin test and a vaccine is available for high risk personnel.

SUITABLE DISINFECTANTS FOR Q-FEVER: 1:100 dilution of chlorine bleach containing 5-25% hypochlorite. 5% hydrogen peroxide. 1:100 Lysol.

BIOSAFETY LEVEL: BL-3 for experimentally infected rodents

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