Coxiella burnetii as a Bioterrorist Agent

Agent: *Coxiella burnetii,* a Gram-negative coccobacillus, is resistant to heat and desiccation and is highly infectious by the aerosol route. This organism is very stable in the environment.

Disease: Q fever

Incubation Period: 10 - 40 days

Signs/Symptoms: Q fever is usually a self-limiting febrile illness lasting 2-14 days. Patients usually present with headaches, fatigue, chills, sweats, and myalgias. Infections range from asymptomatic to severe. Severe headache is present in about 75% of patients. Pneumonia occurs in about half of all patients. There are three presentations of Q fever pneumonia: pneumonia presenting as a fever with no pulmonary symptoms, atypical pneumonia, and rapidly progressive pneumonia. Cough, usually nonproductive, is present in 25-50% of those with radiographically confirmed Q fever pneumonia. Pleuritic chest pain may also occur. Rales are probably the most common physical finding. Patients with rapidly progressing pneumonia often have the signs of pulmonary consolidation. Q fever infections are rarely fatal.

Diagnosis:
Differential Diagnosis: Q fever is not a clinically distinct illness. The atypical pneumonia may resemble a viral illness or pneumonia caused by *Mycoplasma pneumoniae*, *Legionella pneumophila*, *Chlamydia psittaci*, and *Chlamydia pneumoniae*. Rapidly progressing pneumonia mimics bacterial pneumonias due to atypical agents such as *Yersinia pestis* and *Francisella tularensis*; all causes of rapidly progressive pneumonia would enter the differential diagnosis.

Laboratory: Staining sputum is not helpful in identifying organisms. The organism is difficult to culture and is a significant hazard to laboratory personnel. Therefore, diagnosis should be made serologically. Antibody to *C. burnetii* may be identified by indirect fluorescent antibody (IFA), enzyme-linked immunosorbant assay (ELISA), and complement fixation. A fourfold rise in titer between acute and convalescent samples is diagnostic of Q fever.

Paired sera should be collected at least 14 days apart in tiger-top (SST) or red-top tubes. Send specimens for laboratory confirmation in a triple container to the Oregon State Public Health Laboratory, 1717 SW Tenth Avenue, Portland, OR

97201. Prior notification is requested by calling the laboratory at (503) 229-5882 and Acute and Communicable Disease prevention at (503) 731-4024.

Supportive Tests: Chest X-ray abnormalities may be seen in just over half of patients. Non-segmental and segmental pleural-based opacities are common. Rounded opacities and hilar adenopathy are not uncommon. Small pleural effusions may be seen in about 35% of cases. There may be mild elevation (2-3 times the normal) of hepatic transaminase levels. Serum bilirubin is usually normal; however, jaundice may occur. The white blood cell count is increased in one-third of patients. *C. burnetii* has been isolated from the spinal fluid of patients with central nervous system infection, suggested by fever and severe headache; however, spinal fluid is usually normal.

Treatment: Most cases of acute Q fever will resolve without antibiotic treatment. Tetracycline, 500 mg q6h po x 5-7 days or doxycycline 100 mg q12h x 5-7 days are the treatments of choice. A combination of erythromycin 500 mg q6h and rifampin 600 mg qd is also effective. Chronic infection, especially involving endocarditis, often requires extended treatment and should involve appropriate specialists.

Prophylaxis: Tetracycline 500 mg q6h po x 5days or doxycycline 100 mg q12h po x 5 days started 8-12 days postexposure. Antibiotic prophylaxis must be timed properly. Antibiotics given within the first week following exposure will delay but not prevent onset of illness.

Infection Control: Standard precautions should be practiced. Decontaminate surfaces with soap and water or with a 0.5% hypochlorite solution (1 part household bleach added to 9 parts water).

Report: If bioterrorism is suspected, immediately report any cases to your local health department or the Oregon Health Division at (503) 731-4024 during working hours (8:00 am to 5:00 pm Monday through Friday) or (503) 731-4030 nights, weekends and holidays.

Adapted with permission from the Texas Department of Health