Coxiella *burnetii*

General Information

Coxiella burnetii is a gram-negative, obligate intracellular bacterium responsible for Q fever, a zoonotic disease that presents with flu-like symptoms and has the potential to cause chronic infections.

The bacterium has a biphasic life cycle consisting of two forms:

- Small Cell Variant (SCV): A highly resistant form that can endure harsh environmental conditions.
- Large Cell Variant (LCV): A metabolically active form that replicates within host cells.

Transmission

Coxiella burnetii is extremely infectious, with inhalation of just 1–10 organisms capable of causing disease.

It is most commonly found in ruminants such as cattle, sheep, and goats but can also be present in other mammals, birds, and ticks.

Transmission primarily occurs through inhalation of contaminated aerosols from animal waste, placentas, or amniotic fluid. The bacterium can persist in the environment for extended periods due to its resistance to heat, drying, and disinfection.

Symptoms (Animals)

While infections in animals are often asymptomatic, they can cause reproductive issues and other health problems. Many infected animals show no visible symptoms but still shed bacteria through birth fluids, milk, feces, and urine, posing a risk for transmission.

Reproductive Issues:

- Late-term abortion (most common clinical sign)
- Stillbirths
- Premature or weak offspring
- Retained placenta

Other Symptoms (Less Common):

- Infertility
- Mastitis (in some cases)
- Respiratory symptoms (rare)

Symptoms (Humans)

Symptoms of acute Q fever usually begin 1 to 3 weeks after exposure and may include:

- High fever
- Severe headache
- Chills and sweating
- Fatigue and myalgia
- Pneumonia or hepatitis in severe cases

While most acute Q fever cases resolve without intervention, some may require antibiotic treatment.

Chronic Q fever develops in approximately 1–5% of cases, primarily affecting individuals with underlying conditions such as heart valve disease or immunosuppression. It can result in endocarditis, vascular infections, or chronic fatigue syndrome and carries a high risk of mortality if left untreated.

Treatment

Doxycycline is the primary treatment for acute Q fever, whereas chronic Q fever requires extended combination therapy, such as doxycycline with hydroxychloroquine. A human vaccine is not available in most countries.

Prevention and Control

Prevention and control measures include maintaining proper hygiene and biosecurity in livestock management, minimizing exposure to animal birth products and contaminated environments, and pasteurizing milk to reduce transmission risk.

References

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