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Popular Article

Q-Fever

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Abstract

Coxiella burnetii is the bacterium that causes the illness known as Q fever. Goats, sheep and cattle are infected by this bacterium on a natural basis. Animals with *C. burnetii* infection have the bacteria in their urine, faces, milk and other birth products (such as the placenta and amniotic fluid). The infected faces, urine, milk and birth products can contaminate dust, which can then expose people to the disease. Some people hardly ever become sick, but those who do frequently have flu-like symptoms, such as fever, chills, exhaustion and muscle soreness. It is an occupational disease that affects farmers, people who work in butcheries, veterinarians and other people who come into touch with farm animals and their products. Large outbreaks fueled by windborne dissemination have previously been observed. The organism has a very low infective dosage, can survive in the environment for extended and lengthy periods of time. Therefore, it is crucial to find *C. burnetii* in the environment during human and animal epidemic investigations as well as for the management and prevention of Q fever.

Keywords: Q-fever, *Coxiella burnetti*, *Haemophysalis spinigera*, zoonotic disease.

Introduction

While looking into an outbreak of febrile sickness among abattoir workers in Queensland, Australia, Derrick identified Q-fever or (query) fever as a novel clinical entity in 1935. It is a ubiquitous direct anthrapozoonotic disease caused by the rickettsia *Coxiella burnetti*. It is considered as a potential weapon for bioterrorism and classified as a category 'B' critical biological agent by the Centre for disease control and prevention (Kirkan *et al.*, 2008)

Etiology- *Coxiella burnetti*

Gram-negative, obligate intracellular, pleomorphic, coccoid rods and in smears it is often found in pairs or short chains.

By binary fission and the creation of inclusion bodies in the cytoplasm, it can only spread within live tissue. It contains phase I and phase II antigens. Modern molecular methods have identified more than 20 distinct genotypes.

Epidemiology

It is a worldwide zoonosis. The reservoirs are extensive. The incidence of Q fever is unknown and may be underestimated. Mammals, rodents and birds may also act as reservoirs. Though the reports of outbreaks of Q fever in India are scanty, serosurveys have indicated wide prevalence of infection (varying from 2.2 % in pune to 16.6 % in mysore) both in domestic animals and human beings. Serological evidence of the infection has been recorded from Jammu and Kashmir, Delhi, Karnataka, Punjab, Rajasthan, Madhya Pradesh, Bihar, Assam, Orissa, Uttar Pradesh, Maharashtra, Haryana and Tamilnadu. The disease is endemic in most parts of the world, except New Zealand.

Transmission

- Inhalation of infected dust, aerosols in and around premises contaminated with placental tissue, aborted fetus, birth fluid and other discharges of infected animals.
- Direct contact with diseased animals and infected materials
- Ingestion of contaminated unpasteurized milk, raw meat.
- Direct interhuman transmission may occur in hospital discharging organism in sputum of patient. Pregnant women to child and by blood transfusion also possible but very rare.
- The organism is maintained either in sylvan or domestic cycles. Ticks (*Haemophysalis spinigera, Haemophysalis turturis)* play major role in sylvan cycle, since they act as reservoirs.
- In ticks both transovarian and transstadial transmission occur. Tick bite gives infection to variety of mammals and such animals acts as foci. Pregnant sheep is more susceptible.

Clinical signs

In Humans

Incubation period-14 to 28 days

- An influenza-like clinical picture with a rise in fever, a severe frontal headache (a defining symptom) and photophobia.

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- While in the febrile phase, organisms are expelled in the sputum and urine, although interhuman transmission is extremely uncommon.
- There is evidence of CNS involvement and atypical pneumonia.
- Hepatitis or endocarditis might result from chronic fever, chills, intense sweating, cough and inadequate expectoration. Other symptoms include malaise, myalgia, splenomegaly and chest pain.

In animals

- Clinical symptoms are rare
- Organism have a clear preference for mammary glands and the genital canal, including the placenta.
- Apparently healthy animals may shed organism in faces, urine, fetal fluids and milk
- It reactivates in mammals during pregnancy, resulting in abortion (late trimester abortion in sheep and goat), early birth and low birth weight. Even during a routine/normal birth, microbes are present in the fetal membranes.
- In sheep and goat bronchopneumonia is common
- In cases when an organism is chronic, it lives in the udder, remains in the tissues for many months or years and is expelled in the milk for very long lengths of time.
- Subclinical infection in many wild animals.

Diagnosis

1) Very challenging to identify solely based on clinical findings.
2) Pyrexia of unknown origin (PUO), which is mistaken for enteric fever, brucellosis, or dengue fever when the patient's employment entails frequent contact with animals.
3) Pneumonia can be distinguished once it develops (X-rays are helpful in detecting pneumonia).
4) Isolation of the organism using guinea pigs or embryonated chicken eggs
5) 5)Demonstration of the organism in smear from foetal fluids stained with macchiavello, geimsa, immunoperoxidase or by immunofluorescence test (IFT)
6) 6)Polymerase chain reaction
7) In both acute and chronic situations, serological testing such as the complement fixation test.
8) Other more sensitive and specific serological tests include agglutination tests employing the microtiter technique and high-density particle agglutination.
9) The Luto capillary tube agglutination test, which uses hematoxylin-stained antigen to detect

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antibodies in opaque fluids like milk.

10) ELISA

11) Indirect immunofluorescence can also be used for demonstration of organism/antigen.

Treatment

Tetracyclines 2-3g/day orally for the first 24 hours, then 250-500 mg every 6 hours for the next 5 days when the fever has subsided.

Additionally, chloramphenicol may be used.

Prevention and control

1) Since animals are the primary source of infection, controlling the disease in animals will immediately control the disease in humans.
2) In the absence of frank sickness in animals, owners might not experience the disease's full economic impact and farmers might not be very interested in prevention techniques.
3) Milk pasteurisation or boiling
4) Avoid touching discharges such as amniotic fluid, placenta and aborted foetuses with bare hands.
5) After cases of abortion or parturition, stables, barns, sheds and other areas should be disinfected.
6) Organisms are vulnerable to sodium hypochlorite, Lysol (1:100), and formalin fumigation.
7) Dipping can be used to prevent ticks on animals.
8) Regular Q-fever testing of animals before bringing them into the shed
9) Health education of occupational groups, including abattoir workers, dairy employees, shepherds, veterinarians, tannery and wool sorters, about the seriousness of disease, the source of infection, the route of transmission, and personal cleanliness.

Reference

Kirkan S, Kaya O, Tekbiyik S, Parin U. Detection of *Coxiella burnetii* in cattle by PCR. *Turkish Journal of Veterinary & Animal Sciences* 2008; *32*(3): 215-220.

Doung-Ngern P, Chuxnum T, Pangjai D, Opaschaitat P, Kittiwan N, Rodtian P, *et al.*, Seroprevalence of *Coxiella burnetii* antibodies among ruminants and occupationally exposed people in Thailand, 2012–2013. *The American journal of tropical medicine and hygiene* 2017; *96*(4): 786.

Mohan V, Nair A, Kumar M, Dhaka P, Vergis J, Rawool D B, *et al.*, Seropositivity of goats for coxiellosis in Bareilly region of UP India. *Adv. Anim. Vet. Sci* 2017; *5*(5): 226-228.

Villari S, Galluzzo P, Arnone M, Alfano M, Geraci F, Chiarenza G. Seroprevalence of *Coxiella burnetii* infection (Q fever) in sheep farms located in Sicily (Southern Italy) and related risk factors. *small ruminant research* 2018; *164*: 82-86.

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