Rhodococcus equi Infection

Disease Name: *Rhodococcus equi (R. equi)* pneumonia.

Disease Type: *Rhodococcus equi* is an intracellular bacterium that is a common cause of pneumonia with lung abscess formation in foals. Although rare, it can also cause internal abscesses most often in the abdomen and infections in joints. Infections are extremely rare in adult horses.

Transmission: Inhalation of virulent *R. equi* is the major route of pulmonary infection in foals. Infection can also occur by ingestion of the organism but rarely causes pneumonia unless there the foal is exposed to extremely large numbers of bacteria.

Frequency/Risk Factors: *Rhodococcus equi* can commonly be detected in soil from horse farms. The risk of infection is increased on farms with a history of affected foals. The risk of infection also depends on the virulence of the organism and its ability to replicate in macrophages (a type of white blood cell). Farms with the virulent form of the bacteria increases the risk for infection in foals between 3 weeks and 5 months of age.

Incubation period: The incubation period following experimental challenge varies from approximately 9 days 2–4 weeks. The incubation period under field conditions is unknown.

Carrier status: There is no evidence that *R. equi* is contagious between foals. Foals with pneumonia due to *R. equi* can shed higher numbers of organisms and may be a source of environmental contamination .

Latency: *R. equi* pneumonia is often not recognized until it is well advanced and, therefore, difficult to treat. Screening on endemic farms can detect the early stages of disease and combined with appropriate treatment of affected foals can improve outcome. Small abscesses detected by ultrasound can resolve without treatment but early treatment is thought to improve the outcome.

Clinical signs and symptoms: The most common clinical manifestation of *R. equi* infections in foals is pneumonia, which creates lung abscesses. Early clinical signs may only include a slight increase in respiratory rate and a mild fever. These subtle clinical signs are often either missed or ignored, allowing the condition to progress. As the disease progresses, clinical signs can include:

- Decreased appetite
- Lethargy
- Fever
- Increased effort of breathing characterized by nostril flaring and increased abdominal effort.
- Coughing and bilateral nasal discharge

Ultrasonographic screening for early detection has become routine practice at some farms endemic for pneumonia caused by *R. equi. T*he most frequently recognized form of *R. equi* infection on those farms is a subclinical form in which foals develop lung consolidation and/or abscessation without clinical signs. The diagnosis of enterocolitis caused by *R. equi* is

problematic because isolation of *R. equi* from feces cannot be taken as evidence of enterocolitis caused by *R. equi*.

Diagnosis: The distinction between lower respiratory tract infections caused by *R. equi* and those caused by other pathogens is difficult. Clinical signs include

- clinical signs of lower respiratory tract disease,
- cytological evidence of septic airway inflammation, and/or
- radiographic or ultrasonographic evidence of bronchopneumonia.

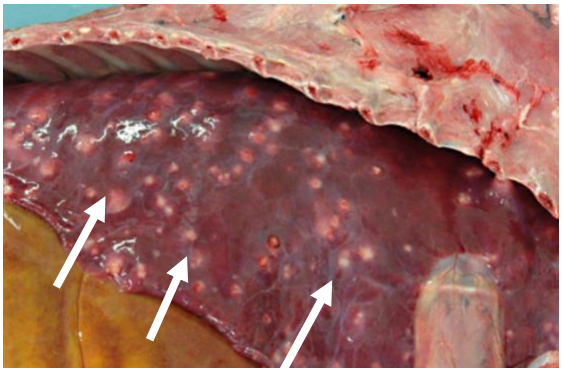
The definitive diagnosis of pneumonia caused by *R. equi* is based on bacteriologic culture or PCR identification of the *vapA* gene from a tracheobronchial aspirate. The definitive diagnosis of extrapulmonary infections (e.g., abdominal abscess, bone infection) caused by *R. equi* must rely on bacteriologic culture or PCR identification of *vapA* from samples from the site of infection. The diagnosis of enterocolitis caused *R. equi* infections on farms where the disease is endemic has relied on early detection of subclinical pulmonary disease using thoracic ultrasonography or radiographs.

Treatment: Long-term administration of macrolide antibiotics and rifampin is the most effective treatment of affected foals. When screening with ultrasound detects subclinical of *R. equi* infection, initiation of treatment with antimicrobial agents prior to development of clinical signs can improve outcome.

Prognosis: Sixty to 70% of foals with clinical signs treated with effective antibiotics will survive. Survival as high as 100% is reported in foals treated based on early detection and monitoring with ultrasound.

Prevention: Screening of foals on endemic farms has improved control of infections. Treatment with hyperimmune plasma during the first 2 days of life followed by a second dose 2-4 weeks later may be effective in preventing infection but should be combined with regular screening.**Biosecurity:** Currently there is no environmental management practices or biosecurity measures which has been shown to control or preventing *R. equi* pneumonia.

Zoonosis: *R. equi* can occasionally cause severe pulmonary or systemic infections in immunosuppressed people. Infections are extremely rare and typically less severe in immunocompetent individuals.



Rhodococcus equi abscesses a foal's lung

