

Review of Foal Pneumonia

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Introduction

Pneumonia is a common condition of neonatal and weanling foals. There are multiple causative agents, but the common underlying theme is an exposure in excess of the foal's immunity. As a foal ages the maternal antibodies wane before the foal has generated a substantial humoral immunity leaving the foal at risk to infections. Lack of adequate colostral intake is a high risk for neonatal foals to develop septicemia and/or respiratory infections.

Diagnostics

There are multiple causes of pneumonia in foals including viral, fungal, bacterial and idiopathic. Clinical signs consistent with respiratory dysfunction are important initial indicators for further diagnostics. Thoracic ultrasound and thoracic radiographs help to identify different types of pathology. Arterial blood gas can identify abnormalities in perfusion and diffusion in the lungs. Tracheal aspirates can help to identify specific bacteria present in tracheal fluids. Conversely broncho-alveolar lavage sample cells and bacteria in the alveolus. Newer diagnostics include PCR testing for a panel of viral agents and streptococcus equi equi.

Causes

Neonatal

Neonatal foals suffer from a variety of respiratory conditions. Primary surfactant deficiency is seen in premature neonates. Trauma and rib fractures can present as dyspnea and pleurodynia. Most commonly pneumonia in the neonatal foal is a consequence of septicemia. Occasionally neonates will present with centrally mediated respiratory conditions whether that be hypoventilation or idiopathic tachypnea.

Older

Older foals are most commonly affected by bacterial pneumonias with *Rhodococcus equi* being the most prominent., although infections with *Streptococcus equi zooepidemicus* are also common. Viral infections with influenza, adenovirus, herpes have all been diagnosed in the author's practice. Parasite migration from ascarids can also show up as low grade respiratory infections. Idiopathic atypical interstitial pneumonia presents as acute respiratory failure and require immediate and aggressive therapy.

Therapy

Treatment is directed at the underlying condition. Supportive care for the respiratory system involves the use of intra-nasal oxygen. Flow rates as high as 200 ml/kg/min have been shown to have little negative impact on healthy foals temporarily. Maintaining very high flow rates can lead to nasal drying and oxygen toxicity. Monitoring and maintaining adequate blood volume with intravenous fluids is important as insensible losses increase with tachypnea and fever.

Neonatal

Maintaining a recumbent neonate in sternal positioning is important to matching perfusion with ventilation and limiting V/Q mismatch induced hypoxemia. Some neonates have hypercapnia and the respiratory drive is hypoxemia. Supplementing these cases will reduce the ventilator drive and worsen the respiratory acidosis and hypercapnia. Use of caffeine and CRI of doxapram have been used in foals with hypoventilation. Caffeine is dosed at 2.5 mg/kg after a 10 mg/kg loading dose give PO or PR BID and doxapram is given at 0.02 – 0.05 mg/kg/h. In addition to supplemental oxygen and stimulating ventilation, antimicrobial and anti-inflammatories are important components of therapy. This author prefers ampicillin (50 mg.kg IV TID) and amikacin (25 mg/kg IV SID) as the first choice of therapy for respiratory infections in neonates. I prefer to not give any NSAIDs to neonatal foals.

Older

Positioning is less critical in the older foal. Supplementing with nasal oxygen is important in hypoxemic and dyspneic foals. The author will let the foal drag the oxygen tubing and the mare learns to stay out of the way. Appropriate diagnosis of the underlying cause is critical. Bacterial culture and sensitivity will help to identify the underlying bacteria. Viral PCR has been an important new tool to help sort out the many different causes of disease. *Rhodococcus equi* is one of the most common causes of pneumonia in the older foal. Oral macrolide therapy is the cornerstone for therapy in R equi infections. Newer generations of macrolides have been developed and are in

common use. Many Strep equi zoepidemicus infections in the author's practice show resistance to macrolides. Additionally a small percentage of R equi isolates also show resistance to macrolides. In addition to antibiotics, NSAIDs are important to control fevers and reduce inflammation.

Idiopathic and undifferentiated interstitial pneumonia can be very difficult cases. Aggressive early therapy with corticosteroids has been important in this author's practice.

Strategies to Control R Equi

Many new advances have been made in R equi management. Data regarding ultrasound screening will be presented. This technique involves a rapid thoracic ultrasound at frequent intervals (2-4 weeks) of all foals on a farm to identify subclinical pneumonia. On endemic farms 70+% of foals will develop pulmonary abscess visible on ultrasound. When, how, and the effect of treating these foals remains controversial. Environmental management is also important with control of the stocking density, mixing of older and younger foals and limiting dust can be helpful in reducing R equi incidence. Use of hyperimmune plasma and chemoprophylactic agents in the first week of life have also been shown to be important in reducing disease.

Conclusion

Foal pneumonia is a common problem on farms with high stocking density. It can also appear sporadically on smaller farms. Understanding the wide range of causes and the different methods to diagnose the cause is important to choose the most successful treatment.

