Proceedings of the 12th International Congress of the World Equine Veterinary Association WEVA

November 2 - 5, 2011
Hyderabad, India

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Rhodococcus equi: Are there differences in clinical appearance around the world?

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Rhodococcus equi is a gram positive facultative intracellular pathogen that is a common cause of pneumonia in foals throughout the world. In addition to pneumonia it has been associated with extrapulmonary diseases such as abdominal abscessation, osteomyelitis, uveitis and polysynovitis; the latter two being regarded as immune mediated reactions to the presence of R. equi at another site.

The clinical disease produced by this bacteria does not appear to vary from country to country or indeed continent to continent. There is no reported or anecdotal evidence to suggest that the actual clinical presentation is variable based on geographical location.

Are there differences in clinical incidence around the world?

Determining if there are differences in the incidence of disease from one location to another has proved problematic by the fact that there is a large variation of incidence of disease from one farm to another within even a small geographical region. Some farms may experience little if any clinical cases, some have sporadic outbreaks and at some the disease is endemic. To complicate issues further the incidence of disease may vary from year to year even on endemic farms.

Moreover, large scale multiple country analysis of morbidity rates is complicated by the means with which the disease is diagnosed. Differentiating between pulmonary disease caused by R. equi and other pathogens is essentially impossible based on clinical signs, ultrasound or radiographic findings (Leclere et al 2009). Where in many cases the history such as appropriate age, reported incidence on the farm in current or previous years, clinical, ultrasound and radiographic findings may be highly suggestive; they do not however provide a definitive diagnosis. This can only be obtained by bacteriologic culture of a tracheobronchial aspirate from an affected foal (foal with clinical, radiographic, ultrasonographic or cytological evidence of disease).

There is much anecdotal evidence and some reported evidence to implicate environmental conditions affecting the incidence of disease and as an extension to that, geographical differences in the incidence of disease.

The density of mares and foals per paddock acre has been shown to be related to the odds of developing disease with high stocking densities associated with higher incidence of disease (Chaffin MK et al 2003 a; Cohen ND et al 2005; Chaffin MK et al 2003b; Cohen ND et al 2008). Higher stocking densities are related with an increased odds of developing many diseases and as such it remains unclear if this increased incidence is related to an overall increase in disease rate or if it is related to other environmental factors affected by stocking densities such as dust levels. Geographical factors frequently influence management practices such as stocking densities and thus indirectly may influence the incidence of disease.
Airborne concentrations of R. equi were correlated with disease incidence at a TB breeding farm in Australia (Muscatello G et al 2006). While scientifically it may be difficult to demonstrate if the increased airborne concentration is a cause or effect of the disease, increased presence of airborne bacteria that is believed to cause infection by inhalation would likely result in increased disease incidence. Factors that may influence the airborne concentration of the bacteria are site (holding pens vs paddocks), warmer ambient temperature, less oil moisture, reduced grass height or absence of grass and date during the breeding season. Thus geographical factors themselves such as mean ambient temperatures, annual rainfall levels, type of soil, grass type or absence and length of the breeding season could all be theorised to be likely to result in increased disease incidence.

References