Farm Management Practices Associated with *Rhodococcus equi* Pneumonia of Foals

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Equine breeding farms with large acreage and large numbers of mares and foals are at increased risk of having foals affected with *Rhodococcus equi* pneumonia. Farms that house their foals on dirt floors are also at increased risk. *R. equi* pneumonia is not associated with neglectful preventative health care practices, and in fact, *R. equi* pneumonia frequently occurs on farms that provide high-quality preventative health care for their foals. Authors’ address: Department of Large Animal Medicine and Surgery, College of Veterinary Medicine, Texas A&M University, College Station, TX 77845. © 2000 AAEP.

Introduction

*Rhodococcus equi* is a frequent cause of pyogranulomatous bronchopneumonia in foals aged 1 to 6 months.\(^1,2\) The pathogenesis of this disease is not fully understood, and the diagnosis, treatment, and prevention can be difficult to achieve.\(^1\) The disease is endemic on some farms and sporadic on others, while on many farms the disease does not occur.\(^1,2\) The organism is present in the soil and in feces from foals and adult horses.\(^2\)

Epidemiologic information regarding farm-level factors associated with increased risk of *R. equi* pneumonia could be helpful for identifying affected farms and for determination of the need for prophylactic measures. A previous study suggested that endemic farms may have a greater number of *R. equi* in the soil than non-endemic farms.\(^3\) There may be accumulative contamination of the environment with *R. equi*, resulting in a higher prevalence of disease in foals.\(^3\) Endemic farms may be heavily contaminated with virulent *R. equi* and the incidence of *R. equi* pneumonia may be correlated with the magnitude of contamination of the environment with virulent *R. equi*.\(^4\)

No previous studies have investigated large numbers of breeding farms to identify farm management factors associated with *R. equi* pneumonia. The purpose of this study was to determine the association of specific farm factors with *R. equi* pneumonia of foals in a large population of breeding farms.

Materials and Methods

This was a prospective, matched case-control study of equine breeding farms attended by veterinarians in Texas. Veterinarians in Texas, who were members of the American Association of Equine Practitioners, participated in this study. Each participating veterinarian was sent two questionnaire forms: one form for farms with foals affected with *R. equi* pneumonia and one form for control farms. For each farm, geographic and demographic information and data on management practices was collected.
Data analysis

Matched sets of affected and control farms were compared using conditional logistic regression to identify factors significantly associated with farms having foals affected with *R. equi* pneumonia. The association between management factors and *R. equi* pneumonia was expressed as the odds ratio (OR) obtained using conditional logistic regression.

**Results**

Complete data was provided for 32 matched pairs of affected and control farms. The following covariates were significantly associated with *R. equi* pneumonia: breed; total size of the farm; number of acres used for housing horses; total number of horses on the farm; total number of foals on the farm; density of horses on the farm; density of foals on the farm; number of transient dam/foal pairs; proportion of resident dam/foal pairs; total number of resident dam/foal pairs; total number of resident mares; existence of transient dam/foal pairs on the farm; number of transient mares that delivered their foal off the farm; and total number of transient mares.

When these variables were analyzed in a multivariate model, affected farms were more likely to be larger in total size and to have a higher number of resident dam/foal pairs. Affected farms were less likely to have a high proportion of their dam/foal pairs as resident dam/foal pairs.

The following covariates regarding foal management were significantly associated with *R. equi* pneumonia: proportion of foal births that were attended; age of foals when weaned; co-mingling of dam/foal pairs; whether foals were tested for adequacy of passive transfer; whether plasma was administered to foals to supplement serum IgG concentration; whether other supplements (other than colostrum or plasma) were administered to foals to supplement IgG concentration; whether foals received hyperimmune *R. equi* plasma; whether mares and foals were vaccinated against *Streptococcus equi*; frequency of deworming the dams; number of anthelmintics used in the dams’ and foals’ parasite control program; whether foals experienced other respiratory infections; whether foals’ stalls had dirt floors; and whether foals were exposed to cattle.

In the multivariate model, affected farms were more likely to administer plasma to foals to supplement serum IgG concentration that were control farms. Affected farms were more likely to have a dirt floor in stalls used for housing foals than were the control farms.

**Discussion**

Epidemiologic information obtained from this study will be useful for veterinarians to help identify farms that are at high risk of having foals affected with *R. equi* pneumonia. Many of the covariates were significantly correlated, therefore they are likely as important as those that remained significant in the multivariate analyses. Farms that housed foals in stalls with dirt floors were more likely to have *R. equi* pneumonia. This finding could be important because *R. equi* resides and proliferates in the soil, and farms could change their facilities to reduce this risk.

Large acreage farms, farms with many mares and foals, and farms that provide high-quality preventative health care for their mares and foals are more likely to have foals affected with *R. equi* pneumonia. These findings indicate that *R. equi* pneumonia is not associated with neglectful farm management practices, but rather is associated with well-managed, large farms. These data must be interpreted with caution; high-quality preventative health care is not likely a causative factor for the development of *R. equi* foal pneumonia.

Increased awareness of these risk factors may enhance practitioners’ ability to predict, recognize, and institute preventative programs for farms that are at risk of having foals affected with *R. equi* pneumonia.

**References**