Extrapulmonary Disorders Associated with *Rhodococcus equi* Pneumonia in Foals: Retrospective Study of 61 Cases (1988–1996)

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Extrapulmonary disorders (EPD’s) are frequently manifested by foals with *Rhodococcus equi* pneumonia and may affect many body systems. In some foals, signs of EPD are recognized prior to respiratory signs and can signal the presence of subclinical pulmonary disease. Some EPD’s exhibit nonspecific signs, thus making diagnosis challenging. The prognosis can be altered by EPD, sometimes despite successful treatment of pneumonia. Increased awareness of EPD will allow practitioners to better diagnose and manage clinical cases of *R. equi* pneumonia. Authors’ address: Dept. of Large Animal Medicine and Surgery, College of Veterinary Medicine, Texas A&M University, College Station, TX 77843-4475. © 1997 AAEP.

1. Introduction

*Rhodococcus equi* is a frequent cause of pyogranulomatous bronchopneumonia in foals aged 1 to 6 months.\(^1\) *R. equi* may also cause extrapulmonary disorders (EPD’s), either associated with or independent of pneumonia.\(^2\)–\(^6\) We have found that EPD’s of *R. equi* are diverse, challenging to diagnose and treat, and can alter case outcome. The purpose of this study is to determine the frequency, clinical signs, methods for diagnosis and treatment, and outcome of EPD’s associated with *R. equi* pneumonia in foals.

2. Materials and Methods

Medical records were reviewed for all foals admitted to Texas Veterinary Medical Center from 1988 to 1996 for which a diagnosis of *R. equi* pneumonia was made. Information was retrieved regarding signalment, history, clinical signs, diagnostic testing, treatment, and survival. For each EPD identified, information was recorded regarding specific clinical signs, methods of diagnosis, treatment, and outcome.

3. Results

Sixty-one foals were selected for inclusion in the study. Mean age at admission was 9.9 ± 3.8 weeks (range = 4–20 weeks). The mean duration of illness at time of admission was 21 ± 17.6 days (median = 7 days; range = 1–60 days). Fifty-six (91.8%) of the foals were referred by another veterinarian. All foals were treated with erythromycin and rifampin; many foals required additional therapy. Thirty-six (59%) foals survived and 25 (41%) foals were euthanatized or died.

At least one EPD was identified in 40 (65.6%) foals

EPD's that frequently manifested signs prior to respiratory disease included immune-mediated polysynovitis, diarrhea, peripheral abscesses, mediastinal lymphadenopathy, septic synovitis, and osteomyelitis. Upon further examination, pneumonia became apparent. Some EPD's were identified during or following treatment for pneumonia and led to death or euthanasia despite improvement or resolution of pneumonia. These EPD's included abdominal lymphadenitis, enteroocolitis, uveitis–keratouveitis, and osteomyelitis. Abdominal lymphadenitis and enteroocolitis were manifested as nonspecific signs, frequently including weight loss or failure to grow. Antemortem diagnosis of abdominal lymphadenitis was made in nine foals by means of abdominal ultrasonography.

Sequelae to antimicrobial treatment of R. equi pneumonia included diarrhea and a syndrome of hyperthermia (>106°F) and tachypnea that developed 1 to 12 days after the initiation of treatment. It was difficult to determine whether these EPD's were caused by antimicrobial treatment or by primary R. equi infection. Diarrhea frequently resolved after the dosage of erythromycin was decreased. Clinical signs of hyperthermia abated with environmental control, alcohol baths, nonsteroidal anti-inflammatory agents, and sometimes the discontinuation of erythromycin.

4. Discussion
Extrapulmonary disorders are prevalent in foals with R. equi pneumonia, as evidenced by the 66% prevalence in our population of foals. This population is predominately a referral caseload of severe cases and likely represents a higher prevalence of EPD than one might expect in other populations. Nonetheless, this study demonstrates the diversity of clinical syndromes that may be encountered with R. equi pneumonia.

Increased practitioner awareness of EPD's associated with R. equi pneumonia will allow for the improved management of affected foals. The early diagnosis of R. equi pneumonia is challenging. Signs of EPD will sometimes precede respiratory signs; a further diagnostic evaluation may reveal the presence of pneumonia. In other cases, EPD's may arise during or after treatment of pneumonia and can alter case outcome despite successful treatment of pneumonia. Some EPD's, such as abdominal lymphadenitis, result in nonspecific signs and thus are diagnostically challenging.

References