Athletic Performance of Horses Previously Infected with *R. equi* Pneumonia as Foals

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The percentage of foals recovering from severe *Rhodococcus equi* infection that eventually race is reduced compared with the national average. For those foals that do race as adults, they perform average. Authors’ address: Dept. of Clinical Sciences, New York State College of Veterinary Medicine—Cornell University, Ithaca, NY 14850. © 1997 AAEP.

1. Introduction

*Rhodococcus equi* infection produces an insidious disease in foals 1 to 4 months of age, with intrapulmonary and extrapulmonary abscessation and organ dysfunction as common sequelae. Although amenable to treatment, this foalhood pneumonia has an impact on later athletic performance that has remained controversial. Christley and Hodgson¹ noted that ~64% of their recovered hospital cases (n = 11) raced at least once, whereas Lavoie et al.² reported that only 23% of the *R. equi* affected foals survived and raced successfully. In both studies, earnings or performance records of cases were not detailed. In contrast, Bernard et al.³ found no significant difference in the average earnings between the *R. equi* affected horses and controls (siblings) or between the *R. equi* affected horses and the average earnings of North American cohorts. However, although this study and those cited earlier established that some recovered foals can successfully race, it remained unknown if the severity of the bacterial infection impacted negatively upon race performance. Thus a multicenter retrospective study was conducted to determine if physical examination parameters, laboratory data, or radiographic abnormalities were associated with (a) reduced survival; (b) a reduced ability to race at least once; or (c) reduced earnings or starts.

2. Material and Methods

The case records of 49 Thoroughbred (TB) and 66 Standardbred (STB) foals admitted to one of six Veterinary Medical Teaching Hospitals between 1984 and 1994 were examined. All cases fulfilled the following criteria: (a) a confirmed diagnosis of pulmonary infection based on isolation of *R. equi* from the transtracheal aspirate and (b) a thoracic radiographic examination performed at the time of hospital admission. Radiographs of each case were scored based on the predominant type of radiographic pattern and the degree of pulmonary involvement. Racing performance was evaluated by accessing the databases of the U.S. Trotting Association and the Jockey Club and determining the starts percentile rank (SPR), average starts, average earnings/start, and lifetime earnings and by comparing these values to the North American averages. The two types of data generated, continuous and categorical, were analyzed by using analysis of variance and odds
ratios, respectively, with $p < 0.05$ considered significant.

3. Results

A. Survival
72% of the foals were discharged from the hospital, although the survival rate of the TB foals was less than that of the STB foals ($p < 0.05$). Foals with tachycardia (heart rate $>100$), tachypnea (respiratory rate $>70$), or in respiratory distress on presentation were more likely to die than those not presenting with abnormalities in these cardiopulmonary parameters. The presence of a mixed bacterial infection was not associated with a reduced survival, but foals presenting with lameness and joint swelling were more likely to die than those foals lacking these clinical signs. Abnormalities in laboratory data included a neutrophilic leukocytosis, a thrombocytosis, and hyperfibrinogenemia, but significant differences between survivors and nonsurvivors in these laboratory values were not found. Radiographic scores were related to survival: Mild radiographic changes were found in 67% of the surviving foals compared with only 24% of the nonsurvivors.

B. Racing Potential
Of the surviving foals, 54% of the TB or STB foals eventually went on to race at least once. There was no association between physical examination parameters and laboratory data on presentation and the ability to race as an adult. However, the majority of the foals that raced (71%) had mild radiographic changes.

C. Performance
The SPR for the entire group was 48, out of possible score 0–99. For the individual cases there was no significant relationship between the SPR and the radiographic score. When the year for which the greatest annual earnings of each horse was compared with the national average earnings, 62% of the horses had earnings that were less than the average. For the remaining horses whose earnings exceeded the national average, their total number of starts exceeded the national average starts.

4. Discussion
Our study suggests that the severity of clinical disease impacts negatively on both survival rates and the ability to race at least once. The more severe the cardiopulmonary disease, either clinically or radiographically, the less likely the foal will survive.

Second, a reduced percentage of recovering foals achieve athletic careers. We found that only 54% of the surviving foals eventually raced at least once, and this proportion is significantly smaller than the 65% of healthy TB or STB foals eventually racing as 2-year-olds. However, for those horses who survive and race, they perform average as reflected by the starts percentile rank of 48. That is, the average earnings per start of the group were only greater than 48% of like horses.

Our findings contrast somewhat with those of Bernard and colleagues and may reflect differences in the severity of clinical disease between the two populations studied. Nevertheless, our finding that prior foalhood infection negatively impacts on athletic performance should not be construed as evidence for withholding antimicrobial treatment or recommending euthanasia. Instead, prophylactic measures to prevent the disease, combined with earlier detection and effective treatment, should be undertaken before severe parenchymal changes or extrapulmonary involvement occurs.

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References
4. This information is from databases of the United States Trotting Association and Jockey Club.