Short- and Long-Term Athletic Outcome of Neonatal Intensive Care Unit Survivors

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The short-term survival rate for the Neonatal Intensive Care Unit (NICU) for the period 1990–1995 was 80.8%. The attrition rate of NICU survivors prior to registration was higher than for the control population. The number of registered NICU survivors with more than one race start was less than the control population. Fifty-nine percent of thoroughbred and 44% of the standardbred foals that were discharged from the NICU had more than one race start. There was no significant difference in the earnings, number of starts, earnings/start, and places/start over the first 2-year period of racing between the NICU survivors with more than one race start and their controls. Authors’ address: Dept. of Clinical Studies, New Bolton Center, University of Pennsylvania School of Veterinary Medicine, Kennett Square, PA 19348. © 1999 AAEP.

1. Introduction
Equine NICUs have greatly improved our knowledge and understanding of the normal and abnormal physiology of the equine neonate, resulting in an improvement in our ability to successfully treat the critically ill equine neonate. The management of these foals is labor intensive and relatively expensive, and there is often emotional involvement of the owner. It therefore becomes very important to be able to give the owner a well-informed prognosis for survival and future usefulness of the foal. The aim of our study was to assess the athletic performance of the NICU racing breed survivors to provide veterinarians with the information necessary to assist their clients in making these difficult decisions.

2. Materials and Methods
Medical records were reviewed for all foals less than 30 days of age presented to the University of Pennsylvania’s Graham French Neonatal Section of the Connelly Intensive Care Unit between 1990 and 1995. Two hundred eighty-seven racing breed foals were identified consisting of 112 standardbreds and 175 thoroughbreds. The major clinical problems of each foal at presentation were identified. They were then assigned to one or more of the following disease categories: hypoxic ischemic syndrome (HIS), septicemia, localized infectious disease (infectious orthopedic and umbilical remnant conditions, pneumonia, diarrhea, meningitis, peritonitis, cellulitis), noninfectious umbilical disease, noninfectious orthopedic disease, meconium impaction, neonatal isoerythrolysis (NI), prematurity/immaturity, and miscellaneous conditions (botulism, congenital malformations, trauma, colic). An individual foal may be represented by several disease categories if it presented with more than one major clinical problem. The number of foals discharged from the
hospital was used to calculate the short-term survival rate. The Jockey Club Information Systems and USTA Registrations were used to obtain the number of NICU survivors that died after hospital discharge prior to registration, the number of NICU survivors that were registered, and the number of starts and places and earnings of those that raced. The produce record of the mare of the NICU foal and the NICU foal’s siblings were used as the control population. A Wilcoxon signed rank test was used to compare the number of starts, places, and earnings of the NICU foals with their controls over the first 2 years of racing.

3. Results

Eighty-one percent (142/175) thoroughbred and 80% (90/112) standardbred foals were discharged from the NICU. Short-term survival rates for specific clinical problems were as follows: HIS (74%), prematurity/immaturity (74%), NI (73%), septicemia (72%), and infectious orthopedic disease (50%). The short-term survival rate (foal deaths recorded by the breed registrations) in the thoroughbred and standardbred control populations were 95% and 98%, respectively. Six percent (9/142) of the thoroughbred and 15.5% (14/90) of the standardbred foals discharged from the hospital were not registered, which may be indicative of loss of usefulness or death. This was higher than the control population (<1%). Information was available on 13 of the unregistered NICU survivors, all had died or were killed, nine were directly or indirectly associated to their problems during the neonatal period. Forty-eight percent (84/175) of the thoroughbred foals admitted to the NICU had more than one race start and of the short-term survivors, 59% (84/142) had more than one race start. This was lower than their control population (79%). Thirty-six percent (40/112) of the standardbred foals admitted to the NICU had more than one race start and of the short-term survivors, 44% (40/90) had more than one race start. This was lower than their control population (66%). Thoroughbred NICU survivors had significantly lower earnings in their first year of racing. However, over a 2-year period there was no significant difference in the earnings, number of starts, earnings/start, and places/start between the thoroughbred and standardbred NICU survivors with more than one race start and their controls. NICU survivors with HIS, septicemia, and localized infectious disease had significantly lower earnings in their first year of racing than their controls. Premature/immature NICU survivors had significantly less places and earnings per start over the 2-year period than their controls.

4. Discussion

The overall short-term survival rate supported the reports of improvement in survival rates that have occurred since 1981. This improvement of the short-term survival rate can be attributed to a combination of factors. These factors include improvement of our knowledge in neonatal foal diseases, the development of NICUs, improved veterinarian and owner awareness in the early detection of neonatal illness, and earlier referral of the sick foal to an intensive care unit. The survival rates for the foals with sepsis, HIS, prematurity, and NI were lower than diseases with noninfectious (meconium impaction, noninfectious orthopedic conditions) diseases. The lower short-term survival rates in some disease categories may reflect the presence of other concurrent diseases such as sepsis.

The attrition rate after hospital discharge and prior to registration was similar to reports from Koterba (7–16%) and Freeman and Paradis (16.3%) and higher than the control population. In deaths related to the neonatal illness, infectious orthopedic conditions were the major cause of mortality.

The number of horses that had more than one race start was lower than the control population. This may reflect residual problems associated with their neonatal illness that were performance limiting. Once racing, however, over a 2-year period, there was no significant difference in the racing performance between the NICU survivors and their controls. These results are similar to reports from foals with central nervous system disorders and R. equi infection. The differences seen in racing performances of horses in the specific disease categories need to be interpreted cautiously due to the small numbers in the groups.

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References