



Miscellaneous Topics

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Besnoitiosis in Donkeys

Cases of a rare parasitic disease called besnoitiosis surfaced in U.S. donkeys in 2011, prompting a group of Cornell University researchers and colleagues to examine the condition—called besnoitiosis—more closely. Sally Ness, DVM, an internal medicine resident at the College of Veterinary Medicine's Equine and Farm Animal Hospital, described the disease, which is characterized by the development of cystic lesions both externally and in the throat and eyes, and weighed in on its detection and treatment.

"Besnoitiosis has recently been diagnosed in donkeys from several states on tissue and blood samples sent to Cornell University," explained Ness. She said the disease might be far more common in donkey populations than previously thought.

Besnoitiosis is caused by a protozoan parasite that is known to affect multiple host species worldwide. Cases are found primarily in Africa and Asia; however, recent outbreaks in European cattle populations suggest the disease could be spreading globally. Besnoitiosis in donkeys and horses is caused by *Besnoitia bennetti*, a coccidial parasite (a single-celled obligate intracellular parasite) that infects the animal, growing within tiny cysts in the skin, organs, and even the eyes of affected animals. So far, the only known cases of besnoitiosis in North America are in donkeys.

Ness and her team have examined donkey herds in the Northeastern and North-western United States with the goal of learning more about the clinical features of besnoitiosis and the best ways to diagnosis it. Currently, the mode of transmission is unknown, and there are no known effective treatments.

She relayed that her research confirmed besnoitiosis in "several donkeys," all of which had numerous lesions both externally (primarily on the face, nostrils, and ears) and in the nasopharynx. Histo-

pathology on skin biopsies is the current gold standard diagnostic technique, however this method requires the examiner to correctly identify the often subtle lesions prior to testing.

To evaluate some new less invasive and potentially more reliable methods for diagnosing besnoitiosis, Ness and her colleagues performed IFAT (indirect fluorescent antibody testing) and immunoblot for serum antibodies to *B. bennetti* on all of these donkeys, using histopathology to confirm disease. One of the goals of their study is to validate a simple and noninvasive test that would be available to both owners and veterinarians.

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DR. JOSIE TRAUB-DARGATZ

Additionally, they tested ponazuril as a treatment for two of the affected donkeys for 37 days. The donkeys did not show any response to treatment, suggesting the drug “does not appear to be an effective treatment, at least at the dose and duration of treatment that we used,” she explained.

“Infected individuals had significantly higher antibody titers to *B. bennetti* than did noninfected individuals, and we may soon be able to offer a serologic test for besnoitiosis in donkeys,” said Ness. “Such a test would be of great value to owners, as this appears to be emerging as a significant disease of donkeys in this country.”

Fever Prevalence in Imported Horses

Thousands of horses enter the United States each year for a variety of reasons, and those arriving via air or ocean must go through a USDA Animal and Plant Health Inspection Service (APHIS) quarantine center to reduce the risk of spreading infectious diseases.

A veterinarian examines each horse when it arrives and throughout the quarantine period. Before a horse can be cleared for release from the quarantine center, he must be held there for a specified period of time, be clinically healthy, officially test negative for several diseases, and have three nonelevated temperatures (less than 101.5°F) recorded for the 24 hours immediately prior to release. USDA:APHIS:Veterinary Services officials completed a study in which they summarized the prevalence of elevated temperature among imported horses and determined risk factors for its occurrence.

“Above-normal body temperature can be the result of a true fever—most often caused by an infection—inflammation, hyperthermia because of heat stress, drug reactions, allergies, tumors, or other causes,” said Josie Traub-Dargatz, DVM, MS, Dipl. ACVIM, professor of equine medicine and epidemiology at Colorado State University. “Other risk factors, such as age, breed, previous experience with air travel, disposition, and location in the cargo area might explain an increased risk for occurrence of elevated body temperature.”

To analyze elevated temperature incidence among imported horses, Traub-Dargatz and co-author Barbara Bischoff, MA, DVM, an APHIS veterinary analyst based in Fort Collins, examined the records of 4,720 horses imported to the United States through one of the three USDA equine quarantine facilities (in New York, California, and Florida) during one calendar year.

Because many factors varied by location, the team used separate data analysis



models for each import center, Traub-Dargatz noted.

The majority of the 2,062 horses that arrived in New York in 2008 were imported from Europe, with the most common countries of origin being Germany (32.4%); the Netherlands (22.2%); and England (17.8%). In 2008 Miami was a destination for 1,600 horses from South American nations, the U.S. Virgin Islands, Europe, and Australasia, with 75% of the horses originating from Argentina or the Netherlands. The majority of the horses arriving in Los Angeles in 2009 originated from Europe, followed by Australia and New Zealand.

What Does it Mean? “This U.S. study showed some clear associations within each import center between the occurrence of elevation in body temperature and risk factors, such as age and breed,” Traub-Dargatz explained.

One association the veterinarians found was more elevated temperature records among younger horses than older horses at all three import centers.

Traub-Dargatz suggested it's possible that younger horses could be at higher risk for developing elevated temperatures due to lack of experience with air transport and/or susceptibility to transport stress.

“It's also possible that the normal body temperature for some of these younger animals is about the 101.5°F (38.6°F) defined as elevated for this report,” she said.

Also, Traub-Dargatz noted that “Friesians were at greater risk than other breeds for elevated temperatures at both LA-AIC and NYAIC; no Friesians were imported through MAIC.” She added that further details related to why certain breeds seem more likely to develop an elevated body temperature were outside the scope of this particular study.

Additionally, “The prevalence of elevated temperatures among horses in quarantine varied by center, and there seemed to be an influence of center not described by the available data,” Traub-Dargatz noted, adding that there were likely additional factors not reviewed in the current study that influenced the elevated temperatures in some of the horses.

Finally, Traub-Dargatz briefly discussed a condition called psychological stress-induced rise in core temperature (PSRCT)

that has been described in the literature: “It seems possible that some of the elevated body temperatures experienced by imported horses on arrival at the import center, particularly those that resolved without treatment or with a single dose of NSAID, represent a form of PRSCT.”

Although the current study yielded a host of information about the prevalence of elevated body temperature in imported

horses, there is much left to learn: “Analysis of the existing data identified several factors associated with risk of an elevation in temperature,” Traub-Dargatz concluded, noting that additional research is needed to precisely pinpoint the cause of and treatments for these elevated temperatures among imported horses.

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