Michelle Anne Kutzler, DVM, PhD

West Nile Virus Research Continues

It was the summer of 2002 and the West Nile Virus (WNV) was making its inexorable journey across the United States. The equine population had already been devastated and there were reports of neurological disease and death in camelids, but no one really knew what the risk was to alpacas and llamas. The Alpaca Research Foundation (ARF) Board of Directors decided that this was a risk which needed to be investigated before it turned ugly in alpacas. This is where Michelle Anne Kutzler, DVM, PhD, assistant professor in the Department of Clinical Sciences at the Oregon State University College of Veterinary Medicine, came in. The call went out for help with WNV in alpacas and Dr. Kutzler answered the call with the first in her series of studies begun in December of 2002.

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Dr. Kutzler's first study[1] involved vaccinating llamas and alpacas with a commercially available WNV vaccine, which had been approved for use only in horses and monitoring the development of virus-neutralizing antibodies in the vaccinated animals. They were carefully evaluated for any untoward side effects from the vaccinations, and none were noted. Horses were also included in this study to accentuate the differences in responsiveness to vaccination between species as well as a "control," since horses had been previously studied in this regard, and it was important to show that this study was compatible with the previous work.

Dr. Kutzler found that while horses responded well to two vaccinations given four weeks apart (compatible with previous reports), it took three vaccinations three weeks apart in camelids to achieve the same level of antibody response. In addition, the third vaccination seemed to prolong the antibody response to greater than 40 weeks (in contra-distinction to an earlier study in camelids in which two vaccinations often resulted in responses which lasted less than 10 weeks). While the vaccine was found to be safe in camelids, there was no specific indication that it effectively minimized the risk of illness due to WNV.

The first indication that the antibodies generated by Dr. Kutzler's vaccinations might work as well in the animals as they did in the laboratory came when two alpacas on the same farm in Colorado became ill with what looked like WNV infection[2]. Serum taken from a WNV-vaccinated llama was used to treat the animals. The first alpaca had been sick for five days, already had significant neurological compromise, and died soon after receiving the serum. The second was treated just at the onset of neurological symptoms and had a complete recovery

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The Alpaca Research Foundation (ARF), in conjunction with Morris Animal Foundation (MAF) and other groups in the llama and alpaca communities, provides funding grants to veterinarians and scientists engaged in research that has the potential to improve the health and well-being of our animals. *Alpacas Magazine* is pleased to bring you another in a series of interviews with the researchers carrying on this important work.

284 bird species have been reported to the Centers for Disease Control's West Nile Virus avian mortality database since 1999. If you find a dead bird in your yard or pasture, do not touch it. Call an animal control officer, instead.

in seven days. Examination of the brain of the first alpaca revealed typical evidence of WNV neurological disease. However, while this observation is highly suggestive, it is not proof that the immune serum was responsible for the recovery. It does point out that if the serum is to be utilized successfully, then it must be used very early in the course of the disease.

Dr. Kutzler has checked WNV antibody titers on random alpacas and alpaca herds in areas of the United States where WNV has been prevalent and has found some herds in which 50% of the animals have been infected, despite the fact that none of them ever exhibited any signs of illness. The implication, of course, is that alpacas generally handle this virus very well. On the other hand, there are documented cases of WNV infection in alpacas with rapid neurological deterioration and death within four days. When an alpaca suffers such a demise, simply measuring WNV antibody levels in the blood is not sufficient to determine the cause of death, since it is possible for an alpaca to have been exposed to WNV, handled the infection well, developed appropriate antibody levels, but then succumbed to another disorder with similar symptoms (possibilities might be Western Equine Encephalitis, Eastern Equine Encephalitis, St. Louis Encephalitis).

In that regard, Dr. Kutzler is presently engaged in a study entitled "Confirmation of West Nile Virus Neurologic Disease in Alpacas Using Reverse Transcriptase Polymerase Chain Reaction (RTPCR) and Immunohistochemistry (IHC)." Brainstem tissue taken from alpacas thought to have succumbed to WNV infection is being sent to Dr. Kutzler from all over the United States by referring veterinarians for analysis. The results of the diagnostic testing will be added to a central database through the ARF website as soon as they become available.

Finally, it is important to understand whether the available vaccines for WNV are truly protective in camelids. The only way to get this information is to expose vaccinated alpacas to the WNV and study the results relative to unvaccinated (and previously unexposed) animals. In August 2004, Dr. Kutzler began work on a project entitled "Experimental West Nile Virus Infection in Vaccinated and Unvaccinated Alpacas." The study, which should be completed in June 2005, will categorically define the ability of the currently recommended WNV vaccination protocol to alter the course of WNV infection in alpacas. This work is being done in concert with collaborating researchers at Colorado State University.

Michelle Anne Kutzler has generated a large body of important information concerning alpacas and WNV in an incredibly short period of time. We at the Alpaca Research Foundation are grateful for the work she has done and feel fortunate to have been able to fund her projects.

REFERENCES

1. Kutzler MA, Baker RJ, Mattson, DE. Humoral response to West Nile virus vaccination in alpacas and llamas. J Am Vet Med Assoc 2004; 225: 414-416.
2. Kutzler MA, Bildfell RJ, Gardner-Graff KK et al. West Nile virus infection in two alpacas. J Am Vet Med Assoc 2004; 225: 921-924.