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NC State finds compression device a promising treatment for horses

Burgetta Eplin Wheeler, BA*

College of Veterinary Medicine, North Carolina State University, Raleigh, NC

*Corresponding author: Ms. Wheeler (bewheele@ncsu.edu)

doi.org/10.2460/ajvr.23.06.0126

Researchers from NC State University have taken technology aimed at helping humans suffering from limb lymphedema and developed a medical device to aid horses also suffering from the condition.

In a pilot study, the device, called the EQ Press, was successful in moving excess lymph fluid up swollen equine limbs and into the lymph nodes.

"Humans suffer from the exact same type of lymphedema horses do, but the difference is that human medicine has a very effective treatment option—pneumatic compression devices," says Lauren Schnabel, professor of equine orthopedic surgery at NC State and study co-author. "So we wanted to create a horse-specific version of those devices and see if it would be similarly effective."

The severity of the condition can vary widely—from temporary swelling due to curtailed mobility to lymphangitis caused by infections that can scar the lymphatic system.

Working closely with a company that manufactures human pneumatic compression devices, Schnabel developed the EQ Press in collaboration with former NC State veterinary student Irina Perdew.

The full EQ Press system uses custom garments designed to accommodate the front and rear limbs of horses. Powered by pumps that tuck into a saddle pad, the device creates cycles of dynamic pressure waves that start at the bottom of the limb and move up, forcing fluid up the limb and eliminating backflow.

"There was anecdotal data that indicated compression treatment worked well for horses, but we wanted scientific evidence that demonstrates the utility of pneumatic compression for such large animals," Schnabel says. "So we designed the NC State pilot study."

In the study, the lower front limbs of 6 healthy thoroughbreds were injected with a tracer isotope—a harmless sulfur colloid that is taken up and excreted through the lymphatic system. A specialized camera followed the progression of the isotope up the lymphatic system and into a lymph node in the upper limb, a process known as lymphoscintigraphy.

Overall, horses treated with EQ Press had significantly accelerated lymphatic flow

Each horse underwent lymphoscintigraphy twice—once with treatment by the EQ Press on the front limbs and once without—randomized between treatment and control.

In all of the EQ Press–treated horses, the camera showed the tracer isotope moving from the lower limb to the lymph node in the upper limb within a 60-minute window. Of the control horses, only 1 showed that the tracer isotope was able to reach the lymph node.

Overall, horses treated with EQ Press had significantly accelerated lymphatic flow compared with untreated horses, recorded as both time to move out of the lower limb and also as time to reach the lymph node in the upper limb.

Schnabel and the research team want to take the encouraging results and study the EQ Press further on horses that have medical conditions such as lymphedema.

The study appears in the *American Journal of Veterinary Research* (https://doi.org/10.2460/ajvr.22.12.0214). Drew Koch, postdoctoral fellow at NC State, is corresponding author of the work. Schnabel is co-founder and chief medical officer of Vetletics, Inc, the company that manufactures the EQ Press.