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Mending Tendon and Joint Injuries with PRP

What makes recommendations for regenerative therapies such as platelet-rich plasma (PRP) inexact is that these approaches are based in biology, not chemistry, said Lisa A. Fortier, DVM, PhD, Dipl. ACVS, of Cornell. Each preparation is just as variable and unique as one horse is to the next. Recognizing this can go a long way in setting clients' expectations for treatment success using these therapies and also in understanding the controversy that surrounds the best ways to use them. All veterinarians can do for the moment is choose cases carefully, extrapolate from current evidence when formulating treatment plans, and be sure to use traditional rehabilitation techniques as well.

"These are not drugs, they are not perfect, and they are not going to work when all of your other approaches fail," said Fortier, who is professor of large animal surgery at the university's vet school, in Ithaca, New York. She summarized current research on PRP and what she's learned using it at the 2014 American Association of Equine Practitioners Convention, held Dec. 6-10 in Salt Lake City, Utah.

The "tremendous degree of variability" among PRP preparations has to do with platelet and leukocyte (a type of specialized white blood cell that aids in healing) concentrations. Current evidence suggests that PRP preparations with platelet concentrations two- to fourfold over what's found in blood and low numbers of leukocytes are optimal for increased tissue repair.

Veterinarians initially used PRP for treating tendons and ligament injuries, but Fortier said there is now evidence it can help heal joint injuries as well. Research has shown that PRP can increase synovial cells' synthesis of hyaluronic acid (HA, an important cartilage component that helps maintain hydrostatic pressures to resist weight-bearing forces) and decrease joint pain and inflammation, making it a promising approach for enhancing early return to activity. Therefore, she recommended only using it in mild to moderate joint disease and pointed to human research: "PRP didn't do anything to help regrow cartilage in human knees, but it did help with pain and returning people to functional activity."

Additionally, long-term, PRP was as—or more—effective than HA in restoring function and decreasing pain in human knee arthritis cases, but the effect lasted longer (a year or more vs. six months for HA).

She said PRP injections can increase tendon matrix production and decrease inflammatory mediators associated with matrix degradation. As with other therapies, however, one of the keys with PRP treatment is treating an injury early—injecting it into a lesion within a few days of injury can stop the progression and growth of a lesion and avoid scar tissue formation.

Fortier reviewed a few questions she commonly fields about PRP:

- **What's the time frame for successful intervention?** It depends on the site and injury severity, but is likely limited to three- to six-month-old injuries.
- **Do I need to add thrombin (an enzyme involved in blood clotting) to activate PRP before injecting it?** No, she says. "When you put PRP into tissue, it clots naturally."
- **After preparing it, how do I know if I actually have PRP?** "Make a smear of whole blood and the PRP, let them air dry, come back and count platelets and stem cells; there should be more in your PRP smear compared to the blood smear," she suggested. "Some (horses) are going to be super PRP makers, and others are not."
- **How long can PRP sit out at room temperature?** "It's safe to draw the blood, do a couple of more farm calls, and then go back and inject the PRP," she said. "You can store it for about a year in the freezer without problems."
- **What size needle should I use, and how much PRP should I inject?** Fortier uses a 23-gauge needle to minimize damage to tissues. For lesions, she simply fills them up with PRP. For joints, Fortier injects 1-3 mL for smaller joints and 3-5 mL for larger ones. But it is important to point out that if injecting stem cells, you need a larger needle—nothing smaller than 21-gauge to avoid killing the stem cells.
- **What's the horse's level of activity following treatment?** The horse resumes active rest with a graded rehabilitation program aimed at getting the horse back to full work in four to six weeks for a joint injury and three to six months for a tendon injury. An attractive aspect to this treatment, she said, is that the horse can go back to work relatively quickly.

Ultimately, Fortier uses PRP as her first line of therapies for both joints and ligaments. She cautions veterinarians that—as with all other treatments in veterinary medicine—PRP doesn't always work. "If you don't get a response for your first injection, you're not going to get a response for a second," so move on to other treatment options.

She also said to remember that even PRP applied early will not cure the horse without other rehabilitation techniques, which include controlled exercise, weight loss, and consistent and good shoeing.

Fortier acknowledged it is unclear which biologic approach is best for certain injuries, given the variable nature of biologic therapy, but veterinarians are commonly using a dual PRP/stem cell approach to counteract the time and performance lost with musculoskeletal injuries.