

Managing Dehydration, Exhaustion in Horses (AAEP 2012)

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Horses can lose up to 15 liters of sweat per hour during strenuous exercise, leaving them in a precarious metabolic balance that cold water hosing alone can't touch. At the 2012 American Association of Equine Practitioners convention, held Dec. 1-5 in Anaheim, Calif., Emma Adam, BVetMed, Dipl. ACVIM, ACVS, an equine practitioner performing research at the University of Kentucky Maxwell H. Gluck Equine Research Center, described ways veterinarians can manage severe dehydration and exhaustion in the field setting.

Why Sweat?

"Muscular activity is the best engine ever designed," Adam began, in her overview of sweating's purpose and effects. However, like any engine, it generates a great deal of heat that the body must eliminate; it does this by drawing it to the skin surface and dissipating it in sweat.

Horse sweat is isotonic and comprised largely of water, sodium, potassium, and chloride, making it similar to horses' blood plasma composition, Adam continued. Human sweat, on the other hand, contains proportionally more water than horse sweat. When we perspire, our blood plasma becomes more concentrated, leaving us feeling thirsty--a sign we need to rehydrate, Adam explained. Because horses lose many more electrolytes and proportionally less water, they do not experience the same thirst response humans do, even if they become excessively dehydrated. Their desire to consume water to rehydrate is essentially eliminated, and they often refuse to drink.

"The loss of so much chloride leads to the retention of bicarbonate in the kidneys in an attempt to maintain electrical charge balance," she explained. This imbalance, she explained, "leads to hypochloremic metabolic alkalosis--the hallmark derangement of strenuous, prolonged exercise as a consequence of sweat loss."

Signs that a horse is approaching or has reached a state of severe dehydration include:

- Excessive sweating (and associated electrolyte and isotonic fluid loss);
- A lack of perspiration (when the horse has stopped sweating in spite of continued exercise and hot ambient conditions);
- Gastrointestinal (GI) tract dysfunction, including minimal gut sounds, no manure being passed, or loose stool;
- Anxiety and muscle twitching or, in severe cases, a lack of responsiveness;
- Synchronous diaphragmatic flutters (commonly called "thumps," analogous in some respects to hiccups);
- Rhabdomyolysis (tying-up); and
- Kidney dysfunction.

She noted that in severe cases, laminitis can be a possible sequela.

Adam said if she sees horses exhibiting a combination of severe dehydration and any of the aforementioned signs, typically she considers them exhausted.

Management Techniques

If the horse is mid-workout when a rider notes signs of problems, he or she should stop exercise immediately, Adam said. Then, attention should be turned to cooling and rehydrating the horse.

If applicable, remove any and all tack, blankets, leg wraps, etc., and apply "copious volumes" of cold water all over the horse; if necessary, use water with ice in it or add isopropyl alcohol (rubbing alcohol) to the icy water, which helps cool the water more efficiently (Adam recommends one part alcohol to three parts ice/water). She stressed that the handler should scrape water off immediately, reapply, then scrape it off again to prevent it from becoming an insulator as it warms. Use fans to help cool the horse that's inside, and bring a horse into a shady area, if possible, if you're cooling him down outside.

Begin fluid replacement as soon as possible. Adam said one of the first things a veterinarian should do is place an intravenous (IV) catheter in one or both jugular veins to facilitate IV fluid therapy. Bear in mind that because of that great fluid loss rate, some severely dehydrated horses might require up to 60 to 80 liters of fluid over a six to 12 hour period to effectively rehydrate ("Don't be afraid of giving a lot of fluid," she stressed). Her first choice for IV fluid is 0.9% normal saline with added potassium and possibly calcium, but any polyionic isotonic fluid will work. Permit the horse to drink if he desires, but Adam recommended monitoring the GI tract closely to ensure gastric reflux does not occur due to related ileus (lack of gut motility). Exertional ileus is a common GI side effect of dehydration and exhaustion, Adam said, and it typically resolves when fluid and electrolyte balances return to normal.

A dehydrated horse could have other internal problems that influence his prognosis--such as renal damage--so Adam recommended monitoring horses' serum electrolytes, serum chemistries, and complete blood count results. She noted that affected horses should be referred to a hospital when:

- They do not urinate after receiving roughly 40 liters of IV fluid;
- They develop respiratory distress, cardiac arrhythmias, or signs of colic; and/or
- They do not respond to therapy after several hours.

Take-Home Message

Most horses recover well from dehydration and exhaustion, Adam concluded. She noted that complications typically do not hinder recovery, although life-threatening conditions such as multi-organ failure and laminitis can occur in serious cases.

Disclaimer: Seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.