Preventing EIPH in Racehorses Using Nasal Strips Instead of Lasix

Tag Words: racehorse, Lasix, nasal strips, performance-enhancing drug, exercise-induced pulmonary hemorrhage

Authors: Rachel E. Walter, with Julie M. Fagan, Ph. D.

Summary:

Lasix is a drug used in thoroughbred racehorses to prevent exercise-induced pulmonary hemorrhage (EIPH), however it can be abused and can cause harm to the animals it is meant to aid. As a non-drug alternative to Lasix, nasal strips have been shown to be just as effective at preventing the harm caused by EIPH and are considered a safe substitute that eliminates the need to inject Lasix and potentially endanger these athletes. However, nasal strips have been banned in some states and as a result, only sparsely used by some owners and trainers. Flair nasal strips used by California Chrome, a much-loved and highly successful racehorse, acted as a catalyst in lifting New York's ban on these strips. We have sent a letter with supporting video to owners, trainers, breeders, and gaming commissions that are directly responsible for the treatment of thoroughbred athletes in the hopes that they would push for a change to lift the ban in all states and promote the safer non-drug alternative to Lasix for the prevention of EIPH.

Video Link: https://youtu.be/XsCkOfA7a9c

The Issue: The All-too-common Use of Lasix to Treat EIPH

EIPH Severity and Incidence

Exercise-induced pulmonary hemorrhage (EIPH), before the introduction and common use of endoscopes in the 1970s, was demarcated by the appearance of blood in the nostrils. The occurrence of epistaxis, however, represents only a small portion of horses that are affected by EIPH. In the modern era, it is known that there are varying degrees of severity for this condition, the most extreme being epistaxis. Utilizing endoscopy, a veterinarian can determine if there is evidence of blood in the trachea. Numerous studies have shown that this form of EIPH was present in 90% of horses after just three races. Even more disturbing is the evidence that nearly all racehorses show evidence of past bleeding in the lungs themselves when a bronchoalveolar lavage is employed to take a sample directly from the organ. Racehorses are not the only equine athletes affected—three-day eventers that are also subjected to high intensity work have shown evidence of the same condition, though at much lower incidence rates (1).

Grading of EIPH

EIPH is such a consistent issue in racing horses that a grading scale of severity has been designed in order to help assess the damage being done to the animal. This scale ranges from
grades 0-4, with grade 0 being no evidence of bleeding anywhere in the respiratory tract. Grade 1 represents a minute number of blood streaks apparent in the trachea or main bronchi and grade 2 is a slight increase upon this number. Grade 3 becomes more severe, signifying one third of the tracheal surface being covered in blood. Grade 4, the most extreme form of this ailment, represents 90% of the tracheal surface being covered in blood, with pooling at the thoracic inlet. Racehorses range anywhere from grades 1-4, as it is believed that all horses bleed into their lungs to some degree during racing (2).

What causes EIPH?

Within the lungs, thousands of units of gas exchange exist, formed by the interaction between alveoli and capillaries. It is within these units that blood meets the oxygen taken in by the lungs to carry the gas to the rest of the body. Under stress, these units are vulnerable to rupture, which is believed to be the cause of EIPH. The high positive pressure of the capillaries and the high negative, or vacuum-like, pressure of the alveoli strain the interface during exercise. This area is incredibly thin and under the high pressure of rapid oxygen intake and carbon dioxide output that occurs during racing the capillary wall may burst and lead to blood secretion into the alveolar unit.

The bleeding caused by ruptures in the gas exchange unit may be so severe that it travels from the lungs, up the windpipe, and can be seen as a nosebleed at its most extreme. The evidence of blood in the upper respiratory tract during exercise is believed to be further impacted by the incredible pressure exerted on the abdomen by the forelimbs when running. The pounding of the front legs increases the pressure in the upper respiratory tract and may make the area more vulnerable to rupture (1).

EIPH and its Effects on Performance

Most, if not all, racehorses experience some form of bleeding during racing. Though, at its least severe, it likely has little effect on the performance of the animal as it is occurring, the presence of blood in the lungs causes inflammation and increases the incidence and severity of further bleeds. The more significant the bleed, the more affected the performance of the animal. When blood is present in the trachea and the nostril, oxygen uptake suffers and performance declines. This condition seems to also worsen with the age of the athlete, putting any long-term racehorse at risk of increased inflammation, tissue damage, and decreased lung capacity. It has been further suggested that EIPH can contribute to the incidence of chronic airway inflammatory disease later in life (1).

Sudden Death Caused by EIPH

Sudden death due to EIPH is rare. If bleeding is severe enough, the lungs may fill with blood to the point of asphyxiation, leading to collapse and death. The risk of such an incident clearly poses incredible danger to both horse and rider. There are multiple recorded cases of such an incident and, upon necropsy, it was found that the animals’ lungs were filled with blood due to EIPH (2).
Lasix: Why it is Used

Lasix, or generically furosemide, works to increase urine frequency and production. Trainers have utilized this aggressive loop diuretic since the 1970s before races to help prevent or reduce EIPH. The drug has effective plasma volume reducing qualities that last for an estimated two to four hours, so it is administered close to race time to reduce blood pressure in the lungs during high intensity exercise. Many believe it to be operational in drawing water away from the lungs and reducing respiratory bleeds (3).

Horses are typically dosed 350-500 milligrams of Lasix four hours before post-time in order to remain just within the window of effectiveness of the drug. After the race, Lasix is quickly cleared from the blood to the urine due to its acidic nature. It is the only permitted medication to be dosed on race day, though many other equine organizations outside of thoroughbred racing prohibit its use entirely (2).

Side Effects of Lasix

As with any diuretic, the most likely risk of Lasix administration is dehydration and electrolyte loss. Due to the magnified frequency of urination, potassium is increasingly expelled, effecting proper muscle function. If the medication is improperly administered, extreme dehydration can result. This condition may cause sudden collapse and even death if severe enough. Horses suffering such intense levels of water loss during exertion are made susceptible to muscle failure and collapse due to incredible physical stress coinciding with dangerous electrolyte imbalance. Further, upon mixing with corticosteroids, electrolyte imbalance can become more severe. Horses are withheld from water four hours prior to the race, causing temporary weight loss, which has been linked to possible performance enhancement (3). However, this potential performance enhancement is coupled with a prolonged recovery time between races, as the horses’ bodies undergo increased physical stress due to this water loss.

Lasix and the Drug Debate

Lasix has been the focus of public debate and controversy for many years and is currently the target of a large anti-medication push backed by various top trainers in the thoroughbred industry. While it is hotly argued whether Lasix is truly beneficial or cruel, the use of furosemide exists as a representative of drug administration as acceptable practice. Many other drugs, some that are completely prohibited, are being utilized by trainers to improve performance and mask lameness issues or injury. The use of Lasix and the debate surrounding it have taken notice away from the use of these illicit drugs that cause harm to equine athletes. The true danger of Lasix is the attention it consumes in the media, overwhelming coverage of more problematic and cruel substances. If furosemide administration were to end and be replaced with an equally, if not more effective, non-drug substitute, the public eye could turn to the abusive use of other drugs that have historically been overshadowed by the constant debate surrounding Lasix.

Nasal Strips: How They Work
Nasal strips are an increasingly used potential replacement for Lasix to prevent EIPH. The effectiveness of this tool has been studied and debated, much like its drug counterpart, yielding results that seem to indicate that nasal strips are as operational as the current treatment for bleeding. According to Howard H. Erickson, DVM, PhD., professor of physiology and history of veterinary medicine at the Kansas State University College of Veterinary Medicine in Manhattan, "At least eight studies have been conducted over the past decade to show exactly how nasal strips work, and there are more than a dozen publications that support the effectiveness of (nasal strips) in reducing exercise-induced pulmonary hemorrhage" (4). Other disciplines such as barrel racing and eventing, have used nasal strips as a means to open the air passageway to the lungs and prevent EIPH. This tool works by tenting the soft tissue portion of the nostril, which is not supported by bone, to alleviate the increased negative pressure experienced in the respiratory system during exercise. Contrarily to humans, horses only intake air via their nose, so when under the incredible stress of racing, the pressure in the nasal passageway surges and the diameter of the tract contracts (5). Nasal strips work by implementing three plastic support bands that are adhered on the horse’s skin on the fleshy parts of the nasal passage. These supports utilize spring force to aid in opening the nostrils during inspiration to assuage the building pressure during exercise and prevent bleeds (4). Studies have shown that nasal strips decrease the effort of breathing, leading to the reduction in pressure that reduces the incidence of EIPH. Further, these studies have supported the idea that nasal strips are as effective as diuretics, like Lasix, in preventing hemorrhage (5).

**Nasal Strips for Humans**

Nasal strips in horses work in the same way they do for humans. Athletes and those who suffer from nasal congestion wear strips to open their air passages to allow for better breathing and less respiratory strain. Both equine and human strips employ spring force to externally support the soft portion of the nose and keep the diameter of the nasal passage from contracting upon inhalation (4). Human athletes can be seen wearing them in competition and utilize these strips for the same reasons some trainers choose to use them for their horses. Nasal strips offer a non-invasive and highly effective means of supporting an athlete’s respiratory health, human and horse alike.

**Racing Bans on Nasal Strips**

Nasal strips have become increasingly popular in the world of thoroughbred racing due to their effectiveness. However, there is some protest that these strips are, in fact, too effective. The question of whether or not these strips enhance performance has become more frequently debated in recent years. In 2012, then-Triple Crown hopeful “I’ll Have Another” was prohibited from wearing the nasal strips that had been used in both the Kentucky Derby and the Preakness preceding the Belmont Stakes. This ban had become part of the rules set down by the New York State Racing and Wagering Board in 2001 (5). Though other states have not followed this trend and will allow the usage of nasal strips, New York’s long-standing ban existed as a major blockade to the non-drug alternative to Lasix. Many believe that nasal strips do not enhance performance, one such authority being New York State Gaming Commission’s equine medical director, Scott Palmer, who stated, “…there is no evidence they have a performance enhancing effect. Equine nasal strips do not pose a welfare or safety risk to the horse. They are applied to
the top of the nose and anyone can see their use prior to a race. If improperly applied, equine nasal strips cannot interfere with performance” (6). The debate as to whether or not nasal strips confer any additional advantage has yet to be settled. Regardless, the true benefit and purpose of this tool is to prevent pulmonary hemorrhage, something the strips do rather well. Flair® nasal strips, the brand worn by last year’s Triple Crown hopeful California Chrome, have been shown to reduced the effects of EIPH by at least 50% (6). Bearing this fact in mind, nasal strips and Lasix can be thought of as performance enhancers in much the same way—EIPH is prevented, so lung capacity is not suppressed. If nasal strips were to completely replace Lasix as a means of averting bleeds, the playing field would be equivalently level.

California Chrome

A similar situation to that of “I’ll Have Another” arose in 2014, when Triple Crown hopeful, California Chrome was nearly pulled from competing in the Belmont stakes when the question of whether or not his Flair® nasal strips would be approved for use by the board. Luckily, due to urgings from various medical experts and Scott Palmer, the medical director of the NY Racing Commission, the ban has since been lifted, allowing California Chrome to compete at the Belmont (8). During this debate, Jeff Blea, president of the American Association of Equine Practitioners, stated “…unlike steroids, nasal strips don’t harm the horses, so they shouldn’t require any regulation. Wearing them isn’t cheating, when every other horse can do the same. When it comes to adhesives, the turf is level. There’s nothing covert about them. They’re visible on the horse and visible to the public ” (7). The lifting of NY’s ban on the use of nasal strips represents an enormous move toward total acceptance of this tool on the part of the typically rigid overseers that control thoroughbred horse racing.

COMMUNITY ACTION: Pushing for the use of Nasal Strips

In order to investigate a positive change in the racing world, those with the most influence and the most at stake must be educated and made aware of the dangers of Lasix and the great advantages of nasal strips. By targeting owners, trainers, and gaming commissions, we can build support for making the change to nasal strips in the hope of, eventually, phasing Lasix out entirely as a means of treating EIPH. This advocacy comes in the form of a letter and video, both intended to educate and initiate change in those directly responsible for the treatment of this country’s equine athletes.

Advocacy video link: https://youtu.be/XsCkOfA7a9c

Advocacy Letter

To Whom It May Concern:

I am Rachel Walter, a soon-to-be graduate of the Rutgers University pre-Vet program with a minor in equine science. I have been involved in horses for over a decade, from riding recreationally and competing to helping to foal out babies destined for the track and working in an equine emergency hospital in the NICU. In these years of being so deeply entrenched in the
equine industry, I have seen one issue make almost no progress, despite the presence of a highly effective solution. This issue is the use of race-day medication, namely, Lasix.

Since the 1970s, Lasix, or furosemide, has been used to prevent the occurrence of exercise-induced pulmonary hemorrhage (EIPH) in racehorses. EIPH is demarcated by a rupturing of the alveolar-capillary unit in the lungs, causing bleeding that creates lasting damage to the animal in the long-run and affects performance in the short-run. The use of Lasix as race-day treatment has become the norm, with 96% of North American starters running on the drug, with little effort to find an alternative solution to the problem of EIPH.

The most common side effect of Lasix administration is dehydration and electrolyte loss, which effects proper muscle function and recovery. If improperly used, horses may collapse and sudden death may occur, due to the severity of the dehydration this drug can trigger. Horses that are consistently given Lasix, as most North American racehorses are, the recovery time between races becomes dramatically increased, weakening these athletes and making them more susceptible to injury and disease due to the added strain of persistent dehydration on their bodies. Further, Lasix supports the ideology of drug-use being acceptable practice for equine athletes, while human sports denounce the utilization of performance-enhancers and punish their use. This practice becomes even more unreasonable when an entirely safe and equally as effective non-drug alternative exists.

Nasal strips work by inhibiting the constriction of the nasal passage and reducing the pressure that causes EIPH. Studies have shown that nasal strips are as effective, if not more effective, than Lasix in preventing bleeds and have none of the negative side effects. Other disciplines such as barrel racing and eventing have used nasal strips as a means to open the air passageway to the lungs and prevent EIPH. This tool works by tenting the soft tissue portion of the nostril, which is not supported by bone, to alleviate the increased negative pressure experienced in the respiratory system during exercise. Three plastic support bands are adhered on the horse’s skin on the fleshy parts of the nasal passage, utilize spring force to aid in opening the nostrils during inspiration to assuage the building pressure during exercise and prevent bleeds. Studies have shown that nasal strips decrease the effort of breathing, leading to the reduction in pressure that reduces the incidence of EIPH. Further, these studies have supported the idea that nasal strips are as effective as diuretics, like Lasix, in preventing hemorrhage. Experts have asserted that nasal strips are entirely safe and, unlike the drug alternative, would not be considered dangerous if improperly applied. To begin to move away from drug use as an acceptable practice and decrease the use of Lasix, racehorse trainers, owners, and spectators should push for a switch to a non-drug alternative to prevent EIPH.

Recently, California Chrome, in his bid for the 2014 Triple Crown, was allowed to wear his Flair nasal strips at the Belmont Stakes, something that has been previously prohibited by other competitors. The lifting of this ban represents a positive move in the direction of completely eliminating the use of Lasix in favor of a non-drug substitute. If more people push and advocate for the use of nasal strips, maybe we can stop eliminate the use of this potentially harmful drug in horseracing all together. For more information, please check out this awareness video at https://youtu.be/XsCkOfA7a9c.
Please do your part in promoting the use of nasal strips and lifting any bans that may exist for their use at the state level or at specific racetracks.

Thank you for your time.

Signed
Rachel Walter

A list of target groups was identified in order to best advocate for allowing the use of nasal strips at the racetrack in all states. These groups represent owners, trainers, breeders, and gaming commissions that are directly responsible for the treatment of thoroughbred athletes. The above advocacy letter and video was sent to the organizations below to push for a change in the switch to the non-drug alternative to Lasix the way the issue of EIPH is addressed.

- Racehorse Owners Association

- National Thoroughbred Racing Association
  http://www.ntra.com

- Jockey Club
  http://www.jockeyclub.com/

- Thoroughbred Owners and Breeders Association
  https://www.toba.org/

- NJ Racing Commission
  http://www.nj.gov/lps/racing/

- NJ Thoroughbred Breeders Association
  http://www.njbreeds.com/

- NY Gaming Commission
  http://www.gaming.ny.gov/horseracing/

- Kentucky Horse Racing Commission
  http://www.khrc.ky.gov/Pages/default.aspx

- California Horse Racing Board
  http://www.chrb.ca.gov/index.html

References


Letter to the Editor:

To the Asbury Park Press, submitted on 3/23/15

LETTER: Pushing for nasal strips over Lasix in our racehorses

To Whom It May Concern:

Since the 1970s, Lasix has been used to prevent the occurrence of EIPH, or Exercise-Induced Pulmonary Hemorrhage, in racehorses. EIPH is demarcated by a rupturing of the alveolar-capillary unit in the lungs, causing bleeding that creates lasting damage to the animal in the long-run and affects performance in the short-run. Lasix, also known as furosemide, is a diuretic that acts to pull fluid away from the lungs and decrease the pressure that is thought to cause EIPH.
Though proven effective, Lasix has been the subject of heavy debate since its introduction into the racing industry.

As a diuretic, Lasix causes electrolyte imbalance and dehydration, which, if severe enough can result in sudden collapse or death. Further, it has been shown to weaken the horse’s ability to recover after races, negatively impacting performance over time. An additional danger of Lasix is the seemingly ubiquitous attention that it draws from those both directly and indirectly involved in horse racing. Lasix is not the only drug that is being administered to our equine athletes; far more dangerous and illicit substances are used on a regular basis to unfairly enhance performance and mask injury or lameness. If less attention was paid to the question of whether or not racehorses should be given Lasix, more time and energy could be spent eliminating the practice of using illicit drugs that put these athletes at risk.

To begin to move away from drug use as an acceptable practice, racehorse trainers, owners, and spectators should push for a switch to a non-drug alternative to prevent EIPH. These nasal strips work by reducing the constricting of the diameter of the nasal passage and reduce the pressure that causes EIPH. Studies have shown that nasal strips are as effective, if not more effective, than Lasix in preventing bleeds and have none of the negative side effects.

Recently, California Chrome, in his bid for the 2014 Triple Crown, was allowed to wear his Flair nasal strips at the Belmont Stakes, something that has been previously prohibited by other competitors. The lifting of this ban represents a positive move in the direction of completely eliminating the use of Lasix in favor of a non-drug substitute. If more people push and advocate for the use of nasal strips, maybe we can stop debating the question of Lasix and start working to eradicate the presence of illicit drugs in horse racing.

Rachel Walter