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HULL SUPPORT THERAPIES IN HORSES WITH LAMINITIS

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Abstract: Aseptic pododermatitis, better known as laminitis, is the most serious condition that affects the hooves of horses. It is a high mortality disease, considered the second leading cause of death in this species, with complex treatment and reserved prognosis (LEISE 2018). Laminitis, as the name already defines it, is an inflammation that occurs in the hoof blades due to the decrease in capillary perfusion inside the limb (ASSIS, 2016). It is a disease of complex and multifactorial etiology (ALMEIDA, 2018). It is considered a secondary disease, as it occurs as a sequel to other pathologies, such as: sepsis, lesions in the contralateral limbs, Cushing's syndrome and equine metabolic/ endocrine syndrome (Parks, 2011). This bibliographic review aims to identify and discuss the main scientific data presented about the treatment and support of the hooves of horses with laminitis between the years 2010 to 2022. According to Pollit in 2009 and Staschak in 2004, corrective shoeing to maintain the parallelism of the dorsal surface of the hoof with the dorsal surface of the third phalanx seems to be the best conduct in the recovery of an animal with laminitis. O'GRADY, in 2010, reports poor results with shoeing in cases where there was no stabilization of the hoof, making it necessary to use local anesthesia in order to suspend the limb of the horse with laminitis for shoeing. Although the animals affected by laminitis do not return to athletic life, it is considered a success in the treatment, when it can be kept pain-free with a minimum of medication, periodic trimming and shoeing up to date to maintain the comfort and well-being of the animal (SILVA, 2019). Therapeutic support in equine hooves is essential in the treatment of laminitis, suggesting that immediate care is what determines the future of this animal, as it is a fact that when there is no hoof in good condition, there is no horse either, taking into account given that the hull is a complex structure, with each part working in unison, and when one part is compromised, so are all the others.

Keywords: Laminitis, aseptic pododermatitis, hoof support therapy, trimming, shoeing.

INTRODUCTION

The blades play an important role in a healthy horse, where forces are transmitted from the ground to the hoof. In the hoof, the transmission of forces takes place from the wall to the blade, to the third phalanx and finally to the entire bone structure that serves as the base of the limb. The hoof is the horny shell that provides protection and support to the extremity of the equine limb. In the normal state, it allows the cushioning of the impact, so it must be an object of permanent attention (SAMPAIO, 2013).

Laminitis is a high mortality disease, considered the second leading cause of death in horses with complex treatment and poor prognosis. (LAW 2018). Since its origin is due to several factors, research reports that laminitis is just a consequence, due to a metabolic and systemic disorder, which affects the cardiovascular, endocrine, the kidney systems, also involving acid-base balance and blood clotting (LASKOSKI, 2016).

Four stages can be identified in the development of laminitis: the first stage is the prodromal (or developmental) stage, when there is initial contact with the etiological agent; the second, the acute phase, when the initial signs of discomfort appear in the limb; third, subacute, by instituting treatment that is able to alleviate claudication and; finally, the fourth, the chronic phase, when there was no success in controlling the process and the vascular condition has already worsened(CARVALHO, 2019).

In antiquity, laminitis was described as a disease that was most often intractable and

fatal. For centuries, information about this disease was acquired from observations of the treatment of naturally occurring cases and thus, advances in the knowledge of the disease were too slow and yielded little conclusive information (WALSH, 2017). Currently, laminitis is still considered the disease of the hooves, leading to a very large percentage of deaths, especially in cases where there is a sinking of the distal phalanx. Knowing that this is an extremely serious disease and that there is no correct protocol to be followed in its treatment, one must first analyze the case as a whole and, through the anamnesis, get as close as possible to what caused the injury. Only after a closed diagnosis, a supportive treatment is initiated, considering that there is no certainty of cure, so the veterinarian initiates a protocol that includes analgesics for pain relief, in the support therapy of the hooves, it is indicated to cryotherapy that aims to delay the action of enzymes responsible for laminar injury, corrective trimming that aims to re-establish parallelism between the phalanx and the hooves in cases of rotation, and therapeutic shoeing that aims to limit more injuries, encourage ideal growth and control local pain (L. STRUGAVA 2022).

Using currently available horseshoes for corrective shoeing can be effective, but sometimes it is preferable to use horseshoes made for each animal according to its needs. The purpose of the procedure is to offer mechanical support to the injured areas and to reduce pressure on the most sensitive areas of the hoof, in addition to the forces exerted on the deep digital flexor tendon (BAKER JR, 2012).

The use of these methods aims to reduce the forces on the injured regions by redistributing them, stimulating blood flow in the region and, mainly, stabilizing the distal phalanx. All these characteristics increase the chances of improvement in the laminitis condition (BAKER JR, 2012).

MATERIALS AND METHODS

This bibliographical review was elaborated with a survey of scientific articles in search engines such as PubMed, Google Scholar, Scielo, BMVZ Library and consecrated books of veterinary medicine, between the years 2010 to 2022, with the objective of identifying and discussing the main scientific data presented about of the treatment and support of the hooves of horses with laminitis. Around 1,680 articles were found that addressed the following topics: laminitis, aseptic pododermatitis, therapeutic trim, horseshoeing and trimming. Among these articles, 430 were analyzed to compare the evolution and changes in recommended therapies over the years.

LITERATURE REVIEW

DEFINITION OF LAMINITIS

Laminitis, as the name already defines it, is an inflammation that occurs in the hoof blades due to the decrease in capillary perfusion inside the limb (ASSIS, 2016). The enzymes initially involved in the condition are matrix metalloproteinases (MMPs) type 2 (MMP-2) and 9 (MMP-9) (LUZ, 2021). Naturally, the activity of MMPs occurs constantly in situations of physiological stress in the horse. When necessary, they are released locally, resulting in disruption of interlamellar connections, in situations of lysis and remodeling. However, the excessive increase of these causes morphological changes in the laminar tissue (LUZ, 2021). The activation mechanism of MMPs is still poorly understood, however, the involvement of bacterial toxins from the gastrointestinal tract and inflammatory cytokines triggered by a systemic inflammatory response are

suggested by the literature as triggering factors (LUZ, 2021). Among the bacterial toxins that activate MMPs, the exotoxins released by Streptococcus bovis are of great importance (LUZ, 2021).

Laminitis is a disease of complex and multifactorial etiology (NEWTON, 2013). It is considered a secondary disease, as it occurs as a sequel to other pathologies, such as: septicemia, lesions in the contralateral limbs, Cushing's syndrome and equine metabolic/ endocrine syndrome (PARKS, 2011), toxemia due to enteritis or colitis, colic due to strangulation, pleuropneumonia, septic metritis (ALMEIDA, 2018). There are authors who also consider that there are predisposing factors to the occurrence of laminitis, namely the administration of corticosteroids, weight gain and diet (WYLIE, 2013).

Some authors report that this disease can be affected by several factors, among them, the high concentration of carbohydrates. Other factors that trigger the disease are the mechanical cause, which is transporting the animal or traction work, which requires a lot of the locomotor system in hard soils (LINCK, 2017).

ANATOMY OF THE HOOF

The equine distal extremity has two tendons inserted into the third phalanx, one of them inserts into the palmar face of the third phalanx, called the tendon of the deep digital flexor muscle, and the other known as the tendon of the common digital extensor muscle, which allows extension in the third phalanx (SILVA, 2021). The hoof (figure 1) is divided into three areas: wall or wall, sole, frog and its subdivisions. The crown is a sensitive swelling that forms the upper part of the hoof. The wall extends from the crown to the ground and must be symmetrical from one side to the other and from the crown to the soleus edge, being divided into pincers, corresponding to the anterior portion, medial and lateral quarters and medial and lateral heels. The wall is between 0.2 and 0.5 cm thick, grows about 8 to 10 mm per month and takes 9 to 12 months to completely renew itself (SAMPAIO, 2013).

Development phase

The development phase of laminitis occurs before the appearance of the first clinical

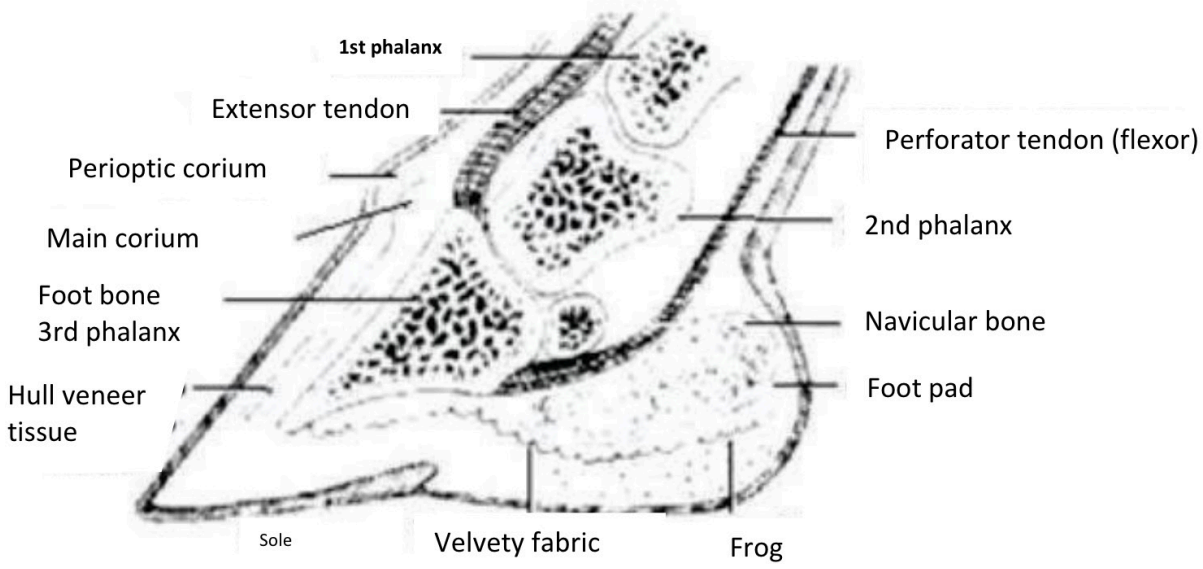

Figure 1 - Morphology of the equine hoof and its divisions. Source: Kesio Alex.

signs, with the beginning of the laminar injury process, although the animal does not have pain, and is called the podrodromic phase. When the animal begins to show the first signs of pain/limping, the so-called acute phase begins. When this phase ends, the chronic phase begins, 72 hours after the beginning of the previous phase or when there is radiographic evidence of laminar separation (FRALEY, 2007).

In this phase, the action of inflammatory mediators takes place, which trigger the process until the onset of the first symptoms of pain in the hooves. The manifestation of this phase is subclinical and it is important to understand that the process of destruction of the laminar juxtaposition apparatus begins in this phase, before the first clinical symptoms of the condition. This phase can take from 8 to 30 hours to install and the time of exposure to the triggering factors must be considered during the anamnesis and clinical examination of the animal (GODOY, 2018).

Acute phase

Acute laminitis is an extremely painful and potentially fatal disease that, in most cases, ends the horse's sporting career. It is a frustrating condition for veterinarians, because current knowledge of the pathophysiology and progression of the disease is insufficient, limiting efforts to successfully prevent and treat the disease (REIS, 2014). The intense pain is due to the separation of sensitive and insensitive hoof blades and consequently the rotation and/or sinking of the third phalanx (STOKES, 2004).

The acute condition is characterized by the onset of clinical signs that include lameness, pain in the hoof pinch region, depression, anorexia, alternation marked by leaning on the limbs (figure 2), reluctance to move, increased pulse in the arteries Fingerprints on palpation and temperature increase on the hoof wall and coronary band. Muscle tremors, increased respiratory rate and rectal temperature are also observed, as well as signs of anxiety (LINCK, 2017).

In general, in the acute phase, it can affect all four limbs, however, it usually affects the forelimbs, probably because they support approximately 60% of the horse's weight. There are situations in which only a single limb is affected, usually due to severe lameness and no support from the contralateral limb (REIS, 2014).

Chronic phase

Chronic laminitis is the progression of the acute condition and begins with the first signs of movement of the third phalanx in relation to the hoof (STASHAK, 2004). There is a mechanical collapse of the laminae that can also occur as a sequel to the subacute phase. The separation of the laminae is a consequence of the severity of the original condition, which includes inflammation, ischemia and thrombosis, in addition to the mechanical stress imposed. The stress of supporting the animal's weight is added to the stress caused by the hoof elevation movement in the pinch zone (REIS, 2014).

Chronic laminitis can still be divided into early, active and stable. The early form begins at the first signs of minimal displacement of the phalanx, and can last for days or months. In the active form, the phalanx has already undergone rotation, but remains unstable and may perforate the palm, with frequent palmar abscesses. Already in the stable form, the phalanx is stable and the hoof begins to grow again (STASHAK, 2004).

Perforation of the sole by the third phalanx can be seen as exudation through the sole (Figure 3). There are alterations in the growth of the hoof, such as depressions in the dorsal hoof wall, dorsal convergence

Figure 2 - Position characteristic of acute laminitis, when the animal distributes the greater weight on the hind limbs, to relieve pain in the affected limb.

Source: Rosivaldo Unir, 2015.

Figure 3 - Chronic laminitis showing rotation of the third phalanx.

Source: Personal archive.

of the growth rings of the wall and claws in poor condition (STASHAK, 2004). Response to hoof pinch is variable. Horses with chronic laminitis often prefer to rotate on their hind limbs and, when walking, place their weight on their heels with an exaggerated movement (REIS, 2014).

DIAGNOSIS

The diagnosis is obtained through clinical history, characteristic clinical signs, radiographic and venographic findings, and also through a complete examination of the hoof with special attention to palpation of the coronary band (FRALEY, 2007).

There are three vital pieces of information to be gained from evaluating a horse and formulating a diagnostic, therapeutic, and prognostic plan: the reason and cause of pain, the location of pain, and the degree of instability within the hoof, 2010).

Thorough physical examination of the horse is mandatory and must be carried out first, as well as, in particular, the detailed hoof assessment (O'GRADY, 2015). A detailed examination of the outer hoof and coronary band often provides very useful diagnostic information. Digital venography is very important in the diagnosis to monitor changes associated with the progression of laminitis (HUNT & WHARTON, 2010).

Early diagnoses are supported by assessing digital pulse intensity, hoof temperature, discomfort and depression in the coronary band (O'GRADY, 2015).

The coronary band must be evaluated for the presence of edema, areas of depression between the proximal extension of the coronary band and the pastern, and lastly, tender/soft areas that are associated with abscesses or hoof wall separation (O'GRADY, 2015).

A depression in this location indicates severe distal displacement of the phalanx distal to and within the hoof capsule (Figure 4). Hoofs must be examined for changes that are indicative of pre-existing chronic laminitis, such as divergent growth of rings and concavity of the hoof wall (Van Eps, 2010).

In most cases, observation of position and movement are strong indicators of the presence of laminitis. The horse may show reluctance to move, frequently shift load between limbs, and generally resist loading the affected limb when the opposite limb is lifted. The horse's position can vary from the normal, up to the typical laminitis position with the forelimbs stretched forward and the hindlimbs tucked under the body (FRALEY, 2007).

The degree of lameness can be established by a rigorous assessment of step-by-step movement. The claudication scale originally developed by Obel in 1948 is useful in clinical cases to document the severity of laminitis (VAN EPS, 2010).

Hoof sensitivity test assessments are useful when the result is positive, however a negative response does not rule out pain or laminitis (O'GRADY, 2015).

Depending on the severity, hoof sensitivity tests may reveal a pain response that is diffuse throughout the entire hoof or localized only to the toes. Application of a manual rotational force to the hoof possibly elicits a more reliable pain response as an indicator for the presence of pain associated with laminitis, particularly in the forelimbs (VAN EPS, 2010).

The degree of rotation of the third phalanx relative to the hoof wall can also be used to establish the prognosis of horses with laminitis. According to Nickels 10 most horses with less than 5.5º of rotation return to their previous athletic function, while those with more than 11.5º of rotation lose their use for physical activities.

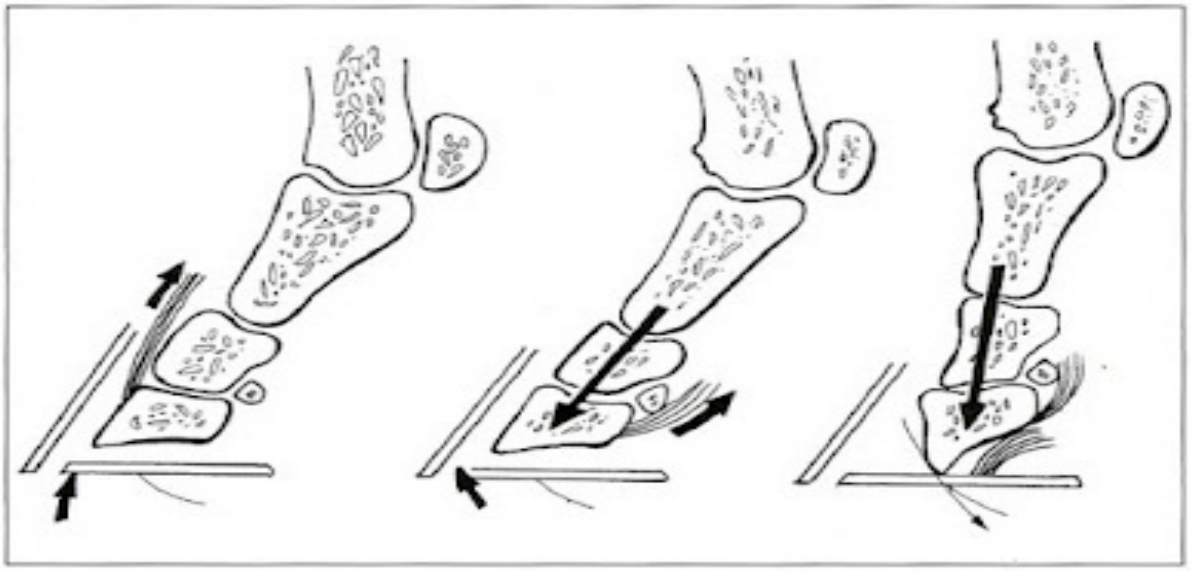

Figure 4 - Third phalanx rotation mechanism.

Source: Rosivaldo Unir, 2015.

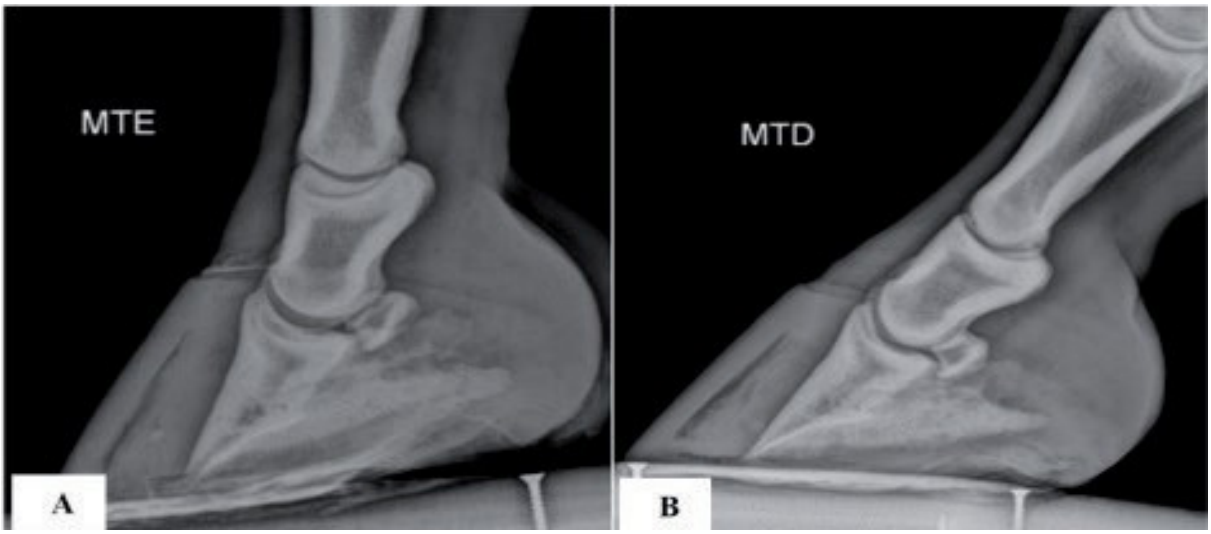

Figure 5 - Radiograph of left and right thoracic limbs with phalanx rotation.

Source: L. Strugava, 2022.

Radiographs (Figure 5) are used to complement the diagnosis of laminitis, monitor the progress of the disease, assist in determining the prognosis and guide hoof care, these must be performed and evaluated systematically (PARKS, 2017). In order to obtain the best information from radiographs, proper hoof preparation, positioning and radiographic exposure are essential.

TREATMENT

Treatments are recommended according to the stage of the disease (LASKOSKI, 2016). Although there are still many contradictions, it is essential that the treatment is also directed to the primary cause in which it has led to the laminitis picture (O'GRADY, 2011).

According to Pierezan (2009), treatment in the acute phase aims to prevent the rotation of the distal phalanx and decrease the levels of vasoconstrictors and systemic hypertension, using analgesics, which aim to reduce pain and catecholamine (vasoconstrictor) secretion by the adrenal glands. The treatment of the chronic phase, on the other hand, is done to prevent further damage to the hoof, such as progressive rotation of the distal phalanx, and systemic injuries. The basic principle for treatment includes cryotherapy, which aims to delay the action of metalloproteinase enzymes (MMPS) that cause laminar necrosis, analgesics to progressively reduce pain, trim the animal to avoid further injuries to the hoof and also avoid phalanx rotation. Choose an ideal therapeutic support for each animal according to the case, using one of the indicated therapeutic shoeing methods (L. STRUGAVA, 2022).

In cases where no treatment is effective, even with all recommendations for pain relief and well-being have been carried out, euthanasia is still the option of choice. The procedure is performed with the intention of not prolonging the animal's suffering. (WHARTON, 2010).

Hoof support therapies

To shoe a horse, it is essential to know the interaction of the hoof structures, the way it is placed on the ground and the surface on which the hoof is placed. When shoeing a horse, it is important to bear in mind that each case is unique (O'GRADY, 2008). In hoof care, cryotherapy is indicated, and other interventions such as confining the horse in a box with sand or shavings. The mechanical support is done through shoeing and therapeutic trimming and these measures aim to prevent and/or minimize the distal rotation of the third phalanx (NICKLES, 2003). The goals of hoof care are to: decrease stress to damaged lamellae and minimize opposing forces (such as the animal weight, TFDP traction, and lever on hoof clamp) that affect phalanx rotation or sinking (NICKELS, 2003). Therapeutic hoof trimming and shoeing has the ability not only to modify the structure, but also to prevent future injuries, control pain and encourage healthy hoof growth (BAKER JR, 2012).

After trimming, it is recommended to apply a polymer to correct the defect in the angle of the sole. In chronic cases, the chosen therapeutic support is used in order to reduce pain, providing greater support at the site and gradual correction of the positioning of the phalanx. The procedure also aims to provide mechanical support to the injured areas and reduce pressure on the most sensitive areas of the hoof, in addition to the forces exerted on the deep digital flexor tendon (BAKER JR, 2012). Fixing the horseshoe can be performed using less traumatic techniques, such as those using: glue, vetrap and screws (BELKRAP, 2011).

There are several methods of trimming and shoeing indicated for horses with

laminitis, however, there is no consensus on the method considered effective, since the individual response is very varied. Therapeutic horseshoe placement plays an important role in the treatment of laminitis, and the types most commonly used include those with a heart-shaped bar, inverted horseshoes with insoles, horseshoes with an oval-shaped bar, horseshoes with insoles, and heel-elevating horseshoes. (STASHAK, 2006).

Other methods available as supportive therapy for animals with chronic laminitis are wooden "shoes" (Steward Clog), foam, silicone, and also the use of plaster. These artifacts reduce the forces on the injured regions by redistributing them, stimulate blood flow in the region and, mainly, stabilize the distal phalanx. All these characteristics increase the chances of improvement in the laminitis condition (BAKER JR, 2012).

The use of horseshoes with elevation for the hooves, especially in cases where tenotomy of the PDDT was performed, is beneficial, as it prevents hyperextension of the interphalangeal joint. Elevation helps to reduce the forces applied on the TFDP and the sensitive lamina tissues (BAKER JR, 2012).

Cryotherapy

During the prodromal or developmental stage, the use of cryotherapy (figure 6) can delay or prevent the appearance of laminitis, but its effectiveness has not been proven to fight the disease from acute conditions already in progress. However, cryotherapy is efficient in promoting analgesia and reducing enzymatic action in inflammation (BAKER JR, 2012).

Despite cryotherapy having its effectiveness proven only for the development phase, the technique has gained ground among clinicians and has been widely used during treatments for laminitis. It must be noted that, if performed, it must be continued for at least seven days and is mainly recommended for cases in which limb edema may disrupt local circulation in the digit, in addition to which, cooling the limb may help maintain the horse's comfort by limiting the intensity of the inflammatory response and local sensitivity to pain (BAKER JR, 2012).

Cryotherapy is capable of reducing the hoof temperature by around 2.8ºC and keeping it that way for a period of 48 hours, being well tolerated by the animals, without presenting adverse effects or abnormalities in the hoof. Digit blood perfusion, and consequently metabolic rates, remain considerably low during cryotherapy (MOORE, 2008).

Wooden support

The wooden shoe (figure 7) has shown numerous benefits and, therefore, is gaining more and more space in equine medicine (STEWARD, 2010). The use of the wooden shoe can redistribute the load evenly in the palmar and plantar section according to its mechanical construction characteristics (O'GRADY, 2009)

It is known that the material is capable of realigning the distal phalanx, in addition to the treatment having advantages such as more accessible materials and non-traumatic application - eliminating the need for local anesthesia (O'GRADY, 2020), heel elevation when necessary and uniformly, and can be changed according to changes observed in radiographic examinations with individual requirements (O'GRADY, 2009). The construction of the basic wooden shoe can be done with two pieces of plywood and a sketch is used to describe the preparation and application in the horseshoe of the horse with dorsal capsular rotation, however obeying the individual needs of each patient. (O'GRADY, 2009). The measurements for its elaboration, therefore, must be based

Figure 6 - Immersion of the limb in ice water.

Source: Previatti, 2019.

Figure 7 – Therapeutic support, made of wood and silicone insole.

Source: Horse University, 2018.

on lateral radiography taken before the hardware (O'GRADY, 2009).

It is concluded that the use of the wooden shoe technique for the treatment of laminitis in horses has mechanical aspects that can be incorporated into other blacksmithing systems previously described, also presenting several new advantages (O'GRADY, 2020), acting in the reduction pain and enhancing the healing process (STEWARD, 2010). It is also known that the alternative can be adapted for different conditions in the feet of horses. (O'GRADY, 2020).

Foams

Another support used in pain relief is based on the application of foam on the sole of the hoof, inviting the horse to share the weight towards the most posterior portion of the hoof. This way, it is possible to reduce the pain in the region of the corium of the sole, which at this stage already presents changes caused by the downward movement of the distal phalanx (POLLITT C.C, 2008). This technique is widely used because it is easy to apply and economical, being known internationally as the best step in the first stage of rehabilitation of a horse with laminitis. If the horse responds positively, stabilizing its clinical picture, the procedure must be maintained for a few weeks (POLLITT C.C, 2008).

The foam blocks are approximately 50-60 mm high and are cut to fit the hull before application. Two blocks are cut, one of which is placed in the posterior portion of the hoof and the next is applied covering the entire sole (POLLITT C.C, 2008). The plates are fixed with an adhesive tape that must pass under the plates. Afterwards, a boot must be made with adhesive around the hoof. All foam boards and frog supports are useful, but at an early stage.

Plaster

In cases of chronic laminitis, another suggested option is the use of a dressing with quick-drying epoxy paste and cotton (figure 8).

Bandages are needed to carry out the corrective dressing: a soft cotton one to place along the frog and an elastic bandage to place along the hoof and keep the previous one in place. First, clean the hoof very well, trim the frog, place the cotton bandage along the frog about 1.5 cm higher than the hoof wall, place the elastic bandage to hold the first one, being very careful to do not tighten the coronary band. Then finish with the epoxy putty, to keep the dressing consistent (DIOGO, 2009).

Lifting the beads

The weight of the horse on the limb is the first force responsible for the serious compromise in the separation of the laminae during the laminitis process. The following separation process arises as a result of rotational forces exerted by contraction of the deep digital flexor muscle at its palmar tendon insertion on the palmar surface of the distal phalanx.

Elevation of the tendons, in limbs affected by acute laminitis, by approximately 12-18 degrees, causes a biomechanical alteration, decreasing the contraction of the deep flexor tendon by approximately 50-60%, helping to avoid or even reduce the dislocation of the phalanx distal and to decrease the pain resulting from the disease. (POLLITT CC, 2008). According to Pollitt (2008) if in the first radiographic study no clear signs of rotation of the distal phalanx are visible, it is possible to immediately resort to this technique. Otherwise, it is advisable to wait for the distal phalanx to assume a normal position in relation to the hoof wall.

Figure 8 - Corrective dressing with epoxy putty and horseshoe with crosspiece.

Source: L. Strugava, 2022.

Horseshoe	**Functions**	**Comments**
Aluminum horseshoe		-Simple and basic. -Light, wide and solid. -The shape can be changed. -Can be glued to the hull.
Wooden horseshoe	-Treatment of chronic laminitis. -Allows you to distribute weight evenly. -Displaces weight over dorsal lamellae when affected.	- Solid construction and flat.
Regular horseshoe with squares or rolling pincers	-Treatment of chronic laminitis. -Facilitates breakover on a dorsal-palmar plane.	-The branches of this horseshoe can be compensated for heel elevation.
Regular horseshoe with a slight bevel on the edges of the horseshoe branches	-Treatment of chronic laminitis. -Facilitates breakover in a medial and lateral direction.	-The branches of this horseshoe can be compensated for heel elevation.
Oval horseshoe	-Inhibits the sinking of the heels, reducing the tension at the level of the TFDP and this way reduces the tension placed on the dorsal laminae.	-Can be modified.
Napoleon horseshoe	-Relieves breakover on the dorsal-palmar plane.	-It is presented open at the front. -Disadvantage: Concentration of stress on the dorsal margin of the horseshoe branches and does not protect the tweezers.
Heart horseshoe	-Reduces the weight on the frog, reducing weight support on the blades.	-It is necessary to be careful and avoid undue pressure on the bars of the heart.

Table 1: description of the types of horseshoe and their applicability in cases of laminitis.

Source: Pedro Almeida, 2018

Types of horseshoes used in the treatment of laminitis

The choice of horseshoe is directly linked to the intended objective, which can be: shifting the center of pressure, changing the area of force distribution, reducing impact shock, increasing ease of movement and protecting areas of the hoof. Several authors talk about the use of horseshoes for the treatment of laminitis. Table 1 lists the different orthopedic horseshoes and in which situations they are used (ALMEIDA, 2018).

RESULTS AND DISCUSSION

According to Pollit in 2009 and Staschak in 2004, corrective shoeing to maintain the parallelism of the dorsal surface of the hoof with the dorsal surface of the third phalanx seems to be the best conduct in the recovery of an animal with laminitis. Already O'GRADY

in 2010 reports poor results with shoeing in cases where there was no stabilization of the hoof, making it necessary to use local anesthesia in order to suspend the limb of the horse with laminitis for shoeing. There is no single shoe that is effective in treating all horses with phalangeal rotation, however there are guidelines that are helpful and can be tailored to the needs of each horse. O'Grady 2010 states that the main considerations involved in selecting horseshoes and shoeing techniques are repositioning the breakpoint, providing support for the sole and frog, and elevating the heels when necessary.

According to Pollit in 2007, hoof trimming in horses with chronic laminitis consists of removing the heels and reducing the dorsal wall of the hoof, with the aim of making the hoof adapt to the new position of the distal phalanx, bearing in mind that once rotated, the return to its anatomical position will no longer be possible. In this case, trimming according to these requirements allows the clinical improvement of the animal with chronic laminitis.

Although the animals affected by laminitis do not return to athletic life, it is considered a success in the treatment, when it can be kept pain-free with a minimum of medication, periodic trimming and shoeing up to date to maintain the comfort and well-being of the animal (SILVA, 2019).

CONCLUSION

Laminitis is a disease that brings a lot of damage not only to animals, but also to their owners. With this in mind, immediate care of the affected hoof and proper attention to the origin of this disease are crucial aspects of maintaining the health and well-being of the horse.

Therapeutic support in equine hooves is essential in the treatment of laminitis, suggesting that immediate care is what determines the future of this animal, as it is a fact that when there is no hoof in good condition, there is no horse either, taking into account Since the hoof is a complex structure, with each part working in unison, and when one part is compromised, all the others are as well, with this the horse can lose its performance and suffer from permanent lameness.

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