

Treatment of Chronic Back Pain in Horses Stimulation of Acupuncture Points with a Low Powered Infrared Laser

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Fourteen horses that could not perform at their expected standards due to chronic back pain of 4 to 48 months duration, and had not obtained lasting improvement from other forms of therapy, were treated by stimulating nine acupuncture points using a low powered infrared laser (300 μ w, 904 nm). The treatments were performed weekly, and consisted of stimulating each point for 2 minutes with a pulse frequency of 360 pulses per second. After completion of a mean of 11 treatments, clinical signs of back pain were alleviated in 10 of the 14 horses, there was no change in three, and one was lost to follow-up. Of the 10 horses who were training and competing, four won. One year after treatment was discontinued, 9 of these 10 horses continued to perform at a standard acceptable to the owner.

POOOR PERFORMANCE due to chronic back pain is common in horses.^{1,2} Many breeds, performing various types of work, are affected. There are many reported causes; however, discerning the specific cause of back pain is often difficult.²⁻⁴ Many treatments for chronic back pain in horses have been used including: systemic, local, and topical application of medications; physical therapy; surgery; and rest.⁵ Some authors state that the majority of horses with chronic back pain will improve with rest.^{4,6} In our experience, response to previously reported treatments has been poor or was transient (a few days to 3 weeks).

Acupuncture has been reported to be useful in treating chronic back pain in humans and animals, including horses.⁷⁻¹⁰ Low powered laser stimulation of acupuncture points has been used to treat chronic pain and other conditions in humans, dogs, cats, and horses.¹¹⁻¹⁷

Acupuncture point stimulation by low powered lasers has two major advantages over other forms of acupuncture—lack of pain during treatment, simplifying restraint, and the lack of necessity for needle puncture and its potential complications.

This study was undertaken to see if the use of a low powered infrared laser is effective as a noninvasive means of stimulating acupuncture points in the treatment of chronic back pain in horses.

Materials and Methods

Fourteen horses were presented because they could not train or perform at an acceptable level. They were referred by veterinarians as potential candidates for acupuncture therapy. All were diagnosed as having dysfunction due to back pain; the criteria for diagnosis were history, physical examination, performance, and radiography (in 4 of the 15 horses). Palpation of the back yielded significant information; painful areas and areas that fasciculate extensively were noted. Normally, horses contract their longissimus dorsi muscle when pressure is applied and relax when the pressure is removed. This relaxation should occur smoothly and quickly. Horses with back pain may guard the affected area, contract their muscle on application of abnormally light pressure, or move away when pressure is applied. After pressure is removed, the muscles

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Presented at the 2nd International Congress of Veterinary Anesthesia, October 9, 1985.

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may have prolonged relaxation time (>2 seconds) or relax in an irregular manner or have prolonged spasms (10–60 seconds). There may be extensive fasciculation during and after application of pressure. There may be an area of fasciculation at a site distant from the site to which the pressure is applied. The signs in each horse were consistent over repeated examinations by two or more examiners.

The 14 horses were 12 Thoroughbreds and 2 Standardbreds; 11 were geldings, 2 were stallions, and 1 was a mare. Five horses were Thoroughbred race horses, two were Standardbred race horses, six were 3 day event horses, and one was a steeplechase horse. The ages ranged from 3 to 9 years (mean, 5.9). The duration of signs before presentation ranged from 4 to 48 months. Seven of the 14 horses had been previously treated for back pain with corticosteroid, tranquilizer, muscle relaxant, or nonsteroidal anti-inflammatory medications, estrone, internal blisters, rest, swimming, heat, or liniments. None of the horses received drug or physical therapy during the period of acupuncture treatment and evaluation. The horses were kept on an exercise regimen appropriate for their intended use.

A gallium-aluminum arsenide semiconductor laser with a power output of 300 μ w, emitting infrared light (wavelength, 904 nm) pulsed at 360 pulses per second, was used.* The emitting surface of the laser was held in contact with the skin over each acupuncture point for 2 minutes.

The acupuncture points used are listed and described¹⁸ in Table 1. "T" is a designation for the name of some acupuncture points over the trunk and should not be confused with a designation for thoracic vertebrae. All the points used are bilateral except T2, which is a single point (Fig. 1–3). All 14 horses were treated at the same five points (T2, T4, TLR, T10, and HL10).

The treatment protocol was one treatment per week for 8 to 16 weeks.¹⁰ Treatment was discontinued once the horse could perform acceptably. If no effect was seen within 8 to 16 weeks, treatment was discontinued. Treatments were given in the standing, untranquilized horse restrained with a halter and lead shank.

The horses were evaluated before, during, and after treatment. Evaluation of each horse was performed by at least three people; one of the authors, the rider or trainer, and the referring veterinarian. Treatment results were classified as follows.

Alleviation of Signs. Horses were placed in this category if results of examination by the authors and the referring veterinarian did not show any clinical signs

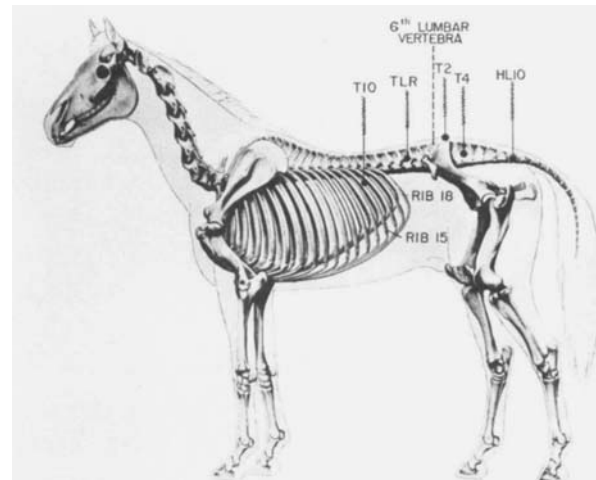


Fig. 1. Left lateral view of the skeleton of the horse showing the location of five acupuncture points (T2, T4, TLR, T10, and HL10). (Adapted from Ellenberger, Dittrich, Baum. An atlas of animal anatomy for artists. In: Brown LS, ed. New York: Dover Publications, Inc., 1956.)

TABLE 1. Location for Acupuncture Points Used in the Treatment of Back Pain in Horses¹⁸

Name of Point	Anatomical Location
T2	On the midline, at the depression above the lumbosacral space (see Figs. 1–3)
T3–8	A straight line is drawn from T2 to the tuber coxae, the most prominent area of the external wing of the ileum; locate a point on this line 2/5 of the distance from T2; from this point, draw a line parallel to the dorsal spines of the vertebrae; points T3–T8 are located on this line; on the lateral side of T2, on the line, is T3; use the distance between T2 and T3 (about 5 cm) to measure and locate T4 caudal to and T5 cranial to T3; in that same manner of measuring, measure from T5 cranially and locate T6, T7, and T8 (see Figs. 1–3)
TLR	On the same line as the above points, at the level of the caudal most edge of the last rib
T10	In the cleft between the longissimus costarum muscle and the longissimus dorsi muscle at the level of the fifteenth intercostal space (see Figs. 1–3)
HL10	At the upper terminal end of the muscle furrow between the biceps femoris muscle and the semitendinosus muscle

* Equine Laser SWA 1001, Pain Suppression Labs Inc., Elmwood Park, NJ 07407.

associated with back pain and the horse was able to perform normally for its intended use, and if the owner thought the performance of the horse was normal.

No Change. Horses were placed in this category if one or more of the three people evaluating the horse said it had not improved at all or enough to fulfill the criteria for the category "alleviation of signs."

Results

The presenting complaints varied between horses, but were consistent for each individual horse. These complaints included crouching (when a rider mounted, a saddle was placed on the horse's back, or the girth was tightened), reluctance to canter or trot, reluctance to take and maintain one lead of the canter, reluctance to back, apparent hind limb lameness with no discernable cause in the hind limbs, refusal to jump, vigorous tail movements, dragging one or both hind toes, and poor performance.

The number of treatments ranged from 2 to 16 (mean, 11). Of the 14 horses treated, clinical signs were alleviated in 10, three were not changed, and one was lost to follow-up. Four of the 10 horses that had their signs alleviated won races. Of the three horses that did not change, two were 3 day event horses. The horse lost to follow-up was a Thoroughbred race horse. All of the horses that had their signs alleviated

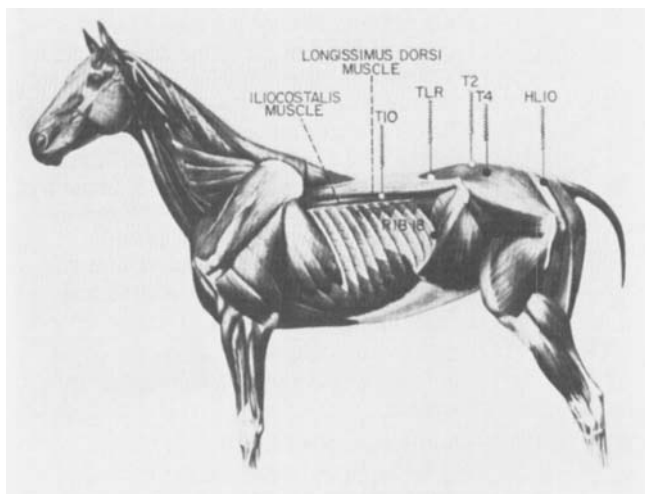


Fig. 2. Left lateral view of a deep dissection of the horse showing five acupuncture points (T2, T4, TLR, T10, and HL10). (Adapted from Ellenberger, Dittrich, Baum. An atlas of animal anatomy for artists. In: Brown LS, ed. New York: Dover Publications, Inc., 1956.)

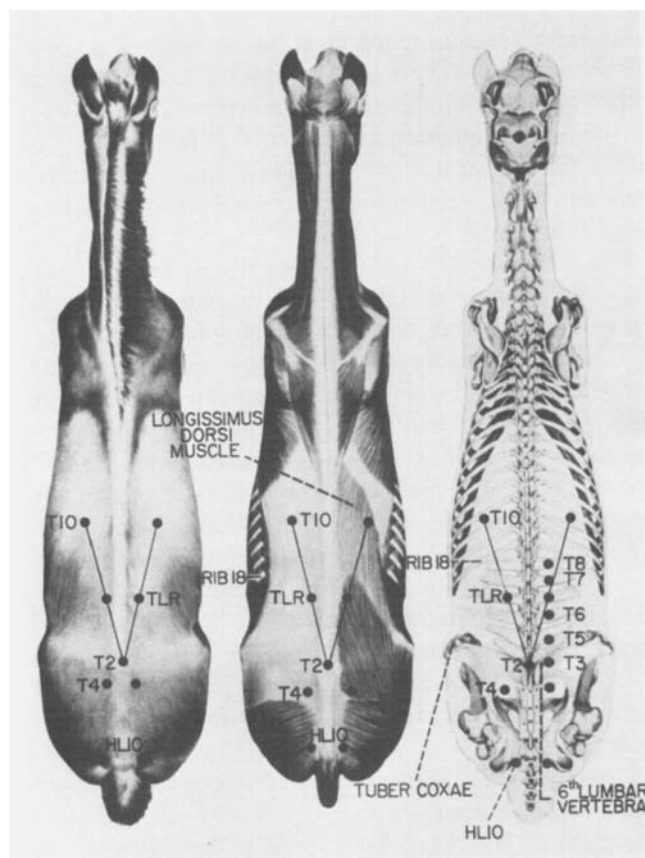


Fig. 3. Dorsal views of the horse. From right to left: skeleton, muscles (superficial muscles on left half and deep on right half), and surface (the head is on top). Five acupuncture points (T2, T4, TLR, T10, and HL10) are labeled on each drawing. (Adapted from Ellenberger, Dittrich, Baum. An atlas of animal anatomy for artists. In: Brown LS, ed. New York: Dover Publications, Inc., 1956.)

were competing after treatment in the same sport as they were expected to compete in before treatment.

All four horses that had standing lateral radiographs taken of the spinous processes were 3 day event horses; two of these had radiographic abnormalities. Two of these four horses had their signs alleviated after treatment (1 of which had radiographic signs of overriding spinous processes), and two did not improve (1 of which had radiographic signs of overriding spinous processes).

The time of the most recent previous treatment before starting acupuncture therapy in the six horses that had received previous treatment varied from 2 to 6 weeks. None of these horses was being helped by the previous treatment at the time of presentation. After acupuncture treatment, one of these six horses was lost to follow-up, four had their signs alleviated, and one did not improve. Eight horses had not received previous treatment for their back pain. After acu-

puncture treatment, six had their signs alleviated and two were not changed.

One year after treatment was discontinued, 9 of the 10 horses that had their signs alleviated continued to perform at acceptable levels.

Discussion

For many years, primary back pain in horses was stated to be rare; most back pain was said to be secondary to dysfunction somewhere in the hind limb or kidneys.⁶ Interest in the back of the horse has increased a great deal over the past 10 years. As this area was investigated, it was found by the authors and others that primary back pain and pathology does occur in horses.^{1-4,10} When a horse has an apparent hind limb lameness, the cause of that lameness must be determined by either finding a cause in the leg for the dysfunction and ruling out primary back pain, ruling out a cause in the hind limb and finding primary back pain, or finding a cause in both areas. Improper riding, and/or a poorly fitting saddle must be ruled out.

There is some disagreement concerning the efficacy of various treatments for chronic back pain. Some authors state that the majority of horses with chronic back pain will improve with rest.^{4,6} In the population of horses presented to us with chronic back pain, that was not the case. The horses either had not responded to these various therapies, or in those that did, the duration of improvement was usually transient (a few days to 3 weeks).

The methods for choosing the acupuncture points to treat various conditions have been described.^{20,21} There are many points that can be used to treat pain in a specific anatomic region; however, it is neither necessary nor advantageous to use them all. Points may be chosen based on traditional Chinese medicine or from published "prescriptions" (standard combinations of points for treating a particular condition) or a combination of both. In general, a few points are chosen in front of, behind, and at the site of pain. The point TLR (see Table 1) is one which is not exactly at the location of a published point, but is one which we have been using because it is often at the most tender region, and is anatomically easy to find.

The treatment schedule used does not appear to be critical; treatments administered between 3 and 10 days apart seem to produce the same effect.¹⁰ In our experience, a number of treatments are necessary to cause an effect, with the maximum improvement usually occurring at 8 to 16 weeks.

Acupuncture is stimulation of acupuncture points with a relatively mild (nontissue damaging) stimulus, to produce physiologic effects including the relief of

pain. The stimulation is often at a site distant to the source of pain. Many different forms of stimulation have been used to produce this effect including low power lasers (<5 mw).^{7,8,10-13,15-17} There is no published information to show that these low powered lasers produce destructive tissue effects.^{11,13,14,23}

From the results reported here, it appears that stimulating acupuncture points with a low powered laser is a clinically useful technique for treating chronic back pain in competing horses. The results in this study are similar to the results obtained in the treatment of chronic back pain in horses with needle acupuncture.¹⁰ In that report, 13 of 15 treated horses became normal. Those horses were treated with standard acupuncture needles left in place for 20 minutes. The treatment schedule was similar to the one used in this report.

The similar results in our two groups (5 horses who had received previous treatment and 8 who had not) indicates that laser acupuncture is a useful clinical modality not only in horses which have not received previous treatment but also in horses which have received previous treatments that were not effective or of short duration.

The advantages that laser acupuncture point stimulation has over needle acupuncture are that it is painless and noninvasive. The disadvantage is the initial cost of the equipment (\$2000-5000).

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