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Case Report

Acupuncture for Anaemia and Large Intestine Impaction Associated with Hind Limb Weakness in a Horse: A Case Report

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ABSTRACT

A 24-year-old horse was presented with a clinical history of anaemia, large intestine impaction and hind limb weakness. Loss of body weight was also reported. Hematocrit and hemoglobin levels were low and piroplasmosis test was negative. Nasogastric intubation with laxative agents was performed and 50 ml of a red blood-cell-supplement was given daily during a month. An assessment following Traditional Chinese Veterinary Medicine (TCVM) principles was performed after the last episode of large intestine impaction. A swollen, pale and wet tongue was observed. A superficial, weak pulse combined punctually with a slippery pulse was detected on the right side. The pulse on the left side was very thin. BL18, BL20 and BL23 were the most sensitive acupoints on the right side. BL18 and BL23 were the most sensitive on the left. TCVM diagnosis was *Qi/Yang* Kidney Deficiency, Spleen *Qi* Deficiency with Stagnation and Blood Deficiency. It received acupuncture at *Bai-Hui,* KI3, KI7, KI10, BL23, GB39, ST36, BL17 and acupressure at SP10. The client reported a significant improvement after treatment and hematocrit and hemoglobin levels were normal. KI3, ST36, BL39 acupoints were treated 14 days later. The outcome was favourable and one acupuncture session per month was recommended. No previous case reports in equines have been documented with a combination of blood, gastrointestinal and musculoskeletal problems in the same episode. This case is an example of an integrative approach to investigate the origin and the interdependent relation between body systems.

1. Introduction

The purpose of this report is to describe a clinical case where acupuncture has been added successfully to an integrative treatment protocol. Acupuncture may be defined as the stimulation of a specific point on the body, known as acupoint, with a specific method, resulting in a therapeutic or hemostatic effect [1]. Acupoints may be classified as regular points, which are located on the 14 regular channels, or extra points, which are located outside these channels [2]. Electric, acoustic, thermal, optical, magnetic, isotopic, and myoelectric responses of acupoints have been shown to differ from surrounding, non-acupoint [3]. Acupuncture has been part of TCVM for centuries. The *Bo Le's Canon of Veterinary Acupuncture* is considered the first veterinary acupuncture text written by Sun Yang (659 BCE-621 BCE) [4]. The original meaning of "*Mai*" is blood vessels; studying the meridians as a circulatory system may also be valid [5]. From a functional point of view, not only vessels themselves, but also, the nerves in the vessel walls have gradually become areas of interest. Moreover, the lymphatic system is also closely related to the meridian system [6]. Acupuncture has evolved into technology. Selective changes in cortical functional magnetic resonance imaging following needling at acupuncture points on the Bladder and Gall Bladder meridian have been studied [7]. Scientific research that supports the use of acupuncture in veterinary medicine has been documented [8]. This is the first clinical case that describes a combination of blood, gastrointestinal and musculoskeletal disorders in a horse, which is resolved from an integrative therapeutic approach.

2. Case presentation

A 24-year-old Hispano-Arab cross pleasure stallion was presented with a three-years history of hind limb weakness. It had a clinical history of large intestine impaction over two years. This problem was presented in four severe episodes with a severe loss of body weight. A blood test was performed. Hematocrit and hemoglobin levels were low in each episode. Piroplasmosis test was

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Figure 1. A 24-year-old Hispano-Arab stallion with a pronounced lordosis.

negative. The anaemic condition was always associated to the impaction. Conventional treatment consisted in nasogastric intubation followed by laxative agents. Red Cell®, a palatable yucca-flavored vitamin-iron-mineral supplement, was administered to stimulate red blood cell production in a daily dose of 50 ml during one-month period.

According to TCVM history, the horse was properly vaccinated and dewormed. Dental care was regularly provided. It was fed with roughage and grain twice a day and it also had access to the pasture daily for 40 minutes. It liked walking outside. It trained in the arena twice a week. It liked cold temperatures. Its personality was wood and fire. It had a pioneer spirit. It was friendly, playful and kind.

A TCVM assessment was made after the last episode of large intestine impaction. *Shen* was normal. Appetite and thirst were normal. Faeces and urine had normal appearance, and defecation and urination frequency were normal. It had a gaseous bowel. Horse's coat quality was good and shiny. It had a pronounced lordosis, but it did not experience pain from this condition (Fig. 1). The tongue was swollen, light pink and pale and wet. It had a thin white coat on the surface. Pulse was taken placing three fingers over the common carotid artery using the same hand for both sides. The index finger is used to locate the upper level or *Feng*, the middle finger to locate the middle level or *Qi* and the ring finger to locate the lower level or *Ming*. Pulse was felt moving the fingers in four ways: lifting (upwards), pressing (downwards), pushing (from side to side) and rolling (proximal to distal). Depth, strength, rate, rhythm and shape were evaluated. The pulse was superficial and weak on the right side and it was combined with a slippery pulse. The pulse on the left side was very thin. Body surface temperature was homogeneous and mild, and ears had mild temperature. Acupoints palpation was performed using a specially designed blunt instrument (Point Finder, straight + bent spherical tip, 2 mm diameter, 17 cm length. www.eurochishop.com). The most sensitive acupoints on the right side were BL18, BL20 and BL23. BL18 and BL23 were the most sensitive on the left.

According to these clinical findings, the TCVM diagnosis was a combination of *Qi/Yang* Kidney Deficiency, Spleen *Qi* Deficiency with Stagnation and Blood Deficiency. Clinical findings associated with *Qi/Yang* Kidney Deficiency were the weakness in hind limbs, a poor conformation in the kidney area due to the degeneration of the spine, a pale, wet and swollen tongue and reactivity at BL23 acupoint in both sides. Severe episodes of large intestine impaction, reduction of body weight, a slippery pulse on the right side and reactivity at BL20 acupoint were related to Spleen *Qi* Deficiency with Stagnation. The chronicity of the process and the advanced age of the animal were both characteristic of a Deficiency pattern. Anaemia, a thin pulse on the left side and difficulty in defecation were clinical signs associated with Blood Deficiency. Tonify Kidney and Spleen *Qi*, tonify Blood and moisten the intestines were the main treatment strategies to minimize the deficiency pattern and improve the intestinal motility.

On its first visit, it received dry needle acupuncture treatment (Ener-Qi® Acupuncture Needle. NOVASAN, S.A. MEDICAL & HEALTH PRODUCTS, Madrid, Spain) at *Bai-Hui* and BL23 (Fig. 2A), KI3, KI7 and GB39 (Fig. 2B), KI10, ST36, BL17 and acupressure at SP10 (Table 1). The horse was placed in a quiet environment and cross-tied. The practitioner was positioned in a safe and comfortable position. Palpation was performed following the acupuncture points guide (Table 1). Needles were inserted using the twisting-rotation technique. First, the needle was inserted through the epidermis perpendicular to the skin. Second, the needle was inserted more deeply to the depth of the acupoint. Last, the needle was manipulated until reaching de-Qi, which can be identified by skin fasciculation, ear or lip movement, or when the horse turns toward the practitioner. *Bai-Hui*, BL17 and BL23 were treated with 0.32 × 25 mm needles, and 0.26 × 13 mm needles were used in the

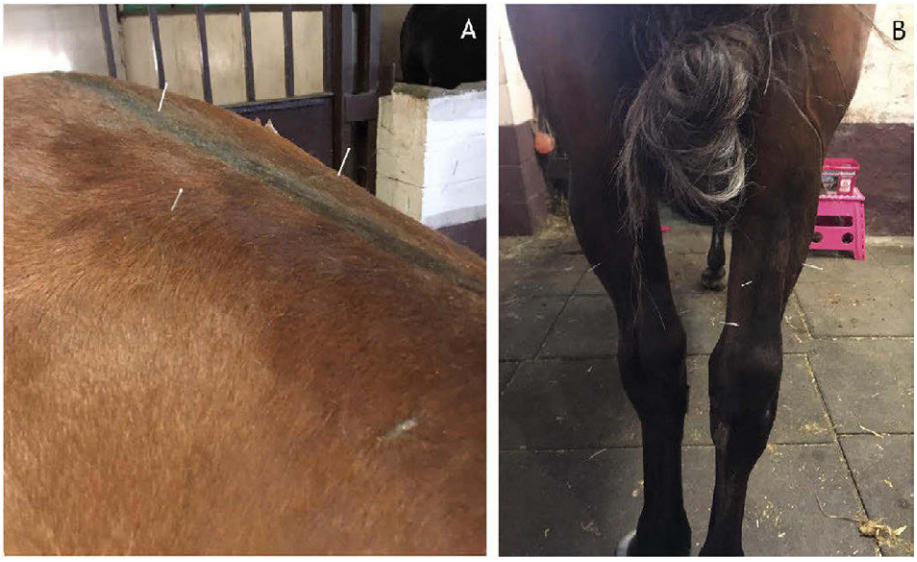

Figure 2. A) The patient receiving acupuncture at *Bai-Hui* and BL23, B) Acupuncture needles in GB39, KI3 and KI7.

Table 1
Acupoints used to treat red blood cells production, impaction and hind limb weakness.

Acupoint	Needle depth (cun)	Location
Bai-Hui	2	On dorsal midline at the lumbosacral space.
KI3	0.5	Between the medial malleolus of the tibia and the calcaneal tuber.
KI7	0.5	2 cun directly proximal to KI3, on the cranial border of the Achilles tendon.
KI10	0.5	On the medial side of the popliteal fossa, between the semitendinosis and the semimembranosis muscles.
BL23	1.5	Second lumbar intervertebral space (L2-L3), 3 cun from the dorsal midline.
GB39	1	3 cun proximal to the tip of the lateral malleolus in a depression of the caudal aspect of the tibia, between the lateral digital extensor muscle and the deep digital flexor muscle.
ST36	1.5	3 cun distal to ST35, 0.5 cun lateral to the cranial aspect of the tibia crest, over the cranial tibialis muscle.
BL17	1	At the 12th intercostal space, 3 cun lateral to the dorsal midline (in the ilicostal muscle groove).
SP10	1.5	2 cun proximal to the proximomedial border of the patella, in the belly of the vastus medialis muscle.

Source: Xie H, Preast V. Xie's veterinary acupuncture. 1st ed. Blackwell Publishing; 2007

hind limbs. Acupressure was chosen because it is a dangerous location. The session lasted 30 minutes. The client reported a significant improvement after treatment. A new blood test was performed. Hematocrit and hemoglobin levels were normal. KI3, ST36, BL39 acupoints were treated 14 days later, following the procedure of the first session. The horse continued with a good condition. The client reported that it had more resistance at work and gas symptoms in the digestive tract had been reduced.

The outcome was favourable. Back stretching exercises and one-acupuncture session per month was recommended.

3. Discussion

According to the TCVM physiology, the Kidney stores Essence (*Jing*), a reserve energy called "pre-natal *Qi*" inherited from the parents. Essence is the critical substance and foundation underlying the entire life. Kidney Essence generates Kidney *Qi* and decreases with aging. To resolve *Qi/Yang* Kidney Deficiency pattern, the following acupoints were treated: *Bai-Hui*, for *Yang* Deficiency, hind limb problems and gaseous bowel; KI3, the *Yuan* (Source) point of Kidney Channel; KI7, metal point and mother point of the Kidney Channel; KI10, water point of the Kidney Channel and *He-sea* point; BL23, Kidney Back-*Shu* Association point. As many patients have experienced an improvement in bowel action when treating points indicated for back pain, *Bai-Hui* was treated on the first visit. No more points, such as GV3, were considered because the horse lacked hind limb propulsion but did not suffer from back pain. According to TCVM literature, Kidney also controls marrow. Marrow includes brain marrow, spinal marrow, and bone marrow [9]. In terms of science, erythropoiesis occurs mainly in the bone marrow, and involves the differentiation of erythroid progenitor cells from hematopoietic stem cells. In renal anaemia, the ability of the kidney to produce erythropoietin is impaired. Inflammatory cytokines supress erythropoiesis in the bone marrow and stimulate hepcidin production in the liver, which negatively affects iron absorption and mobilization [10]. In consequence, tonification of Kidney *Qi* was the first goal in this case not only to treat musculoskeletal signs but also to treat the Blood Deficiency of the anaemia. The points treated were GB39, the Bone Marrow Influential point; BL17, the Blood Influential point; and acupressure at SP10, which invigorates and activates blood. In TCVM, impaction belongs to *Jie zheng*, or obstruction syndrome, a common cause of colic in horses. The function of the Spleen is to digest and absorb food, generate *Gu Qi* (nutrients), and transport *Gu Qi* to the Upper-Burner *(Shang Jiao)* where the lung can distribute it to be used in the whole body. The Stomach sends the rest as waste to the Large Intestine to eliminate faeces. A TCVM dictum states: "Large Intestine is the Minister of the transmission (of faeces) and faeces should never be stored" [2]. Acupuncture treats impaction via regulation of the nervous system and peripheral gastrointestinal hormone contents [11]. Cortisol, substance P and vasoactive intestinal polypeptide (VIP) were studied [12] showing high levels of VIP after electroacupuncture treatment. Using a rat model, electroacupuncture at LI11 and/or ST37 improved faecal water content, defecation frequency, gastrointestinal transit and tryptophan hydroxylase, and serotonin expression was both increased in colonic tissues [13]. Internal dryness is one of the etiologies of large intestine impaction and it can be due to Blood or *Yin* Deficiency [2]. A Deficient *Qi* also fails to eliminate the faeces resulting in an impaction. ST36, Master point for gastrointestinal tract along with *Bai-Hui* were needled to treat impaction. Large Intestine Back-*Shu* Association point, BL25 could have been treated as well. However, it was not considered on the first visit because anaemia was the most critical condition to be treated and this point was assessed for a second visit depending on the patient's progress. Liver Back-*Shu* Association point was also sensitive. As it was a geriatric animal, it was decided not to use too many needles paying attention to the priority condition. In addition to the changes in the nervous system and release of hormones mentioned above, the effectiveness of acupuncture in this case is a result of the underlying mechanisms concerning this technique. The acupoints treated are linked together in a network of meridians, the *Jing-Luo* system. It is the pathway through which *Qi* and blood circulate. It correlates all the tissues and organs and regulates the physiological activities. Scientific studies have demonstrated how radiolabeled material migrates in meridian lines [14] and this migration is powered by the different pressures generated by blood and lymph circulation [15]. As the system forms a network, a number of studies using automatic computerized markers and three-dimensional reconstruction techniques, found an extreme similarity between the interval connective tissue fascia and the meridian longitudinal position [16]. When the acupuncturist twists the needle, the collagen fibers stretch and this stretching in the fascial network of connective tissue and water, disturbs the fibroblasts into responding immediately through various signaling, which includes the release of ATP and the analgesic, inhibitory neurotransmitter adenosine [17]. When local cell contracts are broken by the mechanical deformation, autocrine and paracrine reactions lead to the release of cellular growth factors, kinase cascades, cytokines, cyclooxygenase-2, and nitric oxide enzymes and peptides. Gene activation also occurs, including those for protein synthesis, gene transcription factors, and even proto-oncogenes [17]. Meridian paths have a higher excitability, which may be due to the excitatory threshold determined by transmembrane ion concentration difference and ion flow. Calcium ions are involved in the meridian activities [18]. Sodium and potassium are also involved in the functional activities of meridians [19]. As a result of this bioelectrical network, the meridians have low impedance and high electrical conductivity properties [20].

In brief, the main hypothesis to treat this case was a Kidney *Qi* Deficiency pattern, that decreased red blood cells production, which led to anaemia and, in consequence, to a Blood Deficiency. Thus, it could be the origin of the large intestine impaction. No previous literature in veterinary and human medicine has been

found in the relation of anaemia, large intestine impaction and hind limb weakness, treated with acupuncture. Further research with sufficient long-term follow-up is needed, as well as more clinical examples in the application of integrative veterinary medicine.

Ethical approval/animal welfare statement

All animals were assessed and treated as part of routine clinical practice in accordance with good veterinary practice. It did not require separate ethical approval according to regulations.

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Conflicts of interest

The author has neither financial interests nor conflicts of interest to declare in relation to the material in the manuscript.

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