

The Use of Traditional Chinese Veterinary Medicine; Dry Needle Acupuncture Integrated with Conventional Veterinary Medicine for Impaction Colic Treatment in Horse: A Clinical Case Report

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Abstract

A 4-year-old, 239 kilograms, Thai native gelding was presented with a history of downcast, decrease appetite, reduced water intake, and no defecation seen in 4 days. It showed the clinical signs of moderate to severe abdominal pain which could be from being fed with corn silage (bovine roughage) for a week instead of grass or hay. The veterinary clinician decided to perform Chinese traditional treatment; dry needle acupuncture, in combination with conventional veterinary medicine after several days of conventional treatment with no signs of improvement. Such integration had led to gradual changes such as the improvement of vital signs, responsiveness, increase appetite and normal defecation. Additionally, treatment complications as well as the recurrent signs of colic were absent. Although conventional veterinary medicine is generally accepted worldwide, Chinese acupuncture is an interesting alternative treatment which could be integrated in order to maximize the treatment effectiveness and to minimize any complications from conventional colic treatment.

Keywords: horse, impaction colic, acupuncture, integrative medicine

รายงานทางคลินิก: การผสมผสานระหว่างการแพทย์แผนจีน ด้วยการฝังเข็มและการแพทย์แผนปัจจุบันในการแก้ไขภาวะเสียด จากระบบทางเดินอาหารอัดแน่นในม้า

นิติพล ศรีอ่อนรอด

สาขาวิชาสัตวศาสตร์ ศัลยศาสตร์ และอายุรศาสตร์ทางสัตวแพทย์ คณะสัตวแพทยศาสตร์ มหาวิทยาลัยเวสเทิร์น
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บทคัดย่อ

ม้าพันธุ์ไทยพื้นเมือง เพศผู้ตอน อายุ 4 ปี น้ำหนัก 239 กิโลกรัม มีประวัติการกินข้าวโพดหมัก แทนการกินหญ้าแห้งมากกว่า 7 วัน มีอาการเบื่ออาหาร ไม่มีความอยากกินอาหาร ซึม คอตก ไม่ตอบสนองต่อสิ่งแวดล้อม ไม่ค่อยดื่มน้ำ และไม่อุจจาระมาประมาณ 4 วัน หลังจากสัตวแพทย์ลงพื้นที่เข้าทำการรักษาทางภาคสนาม ร่วมกับการรักษาความผิดปกติของระบบทางเดินอาหารทางแพทย์แผนจีนด้วยวิธีการฝังเข็ม ม้าตอบสนองต่อการรักษา โดยมีอาการทางคลินิกที่ดีขึ้นตามลำดับ อาทิ สัญญาณชีพ การตอบสนองต่อสิ่งแวดล้อมที่ดีขึ้น มีความอยากกินอาหารมากขึ้น ขับถ่ายอุจจาระเป็นปกติ สัตวแพทย์ได้ทำการตรวจติดตามการรักษา ไม่พบว่ามีความผิดปกติจากการรักษาทางการแพทย์แผนปัจจุบันร่วมกับการรักษาทางการแพทย์แผนจีนด้วยวิธีการฝังเข็ม และม้าไม่กลับมาแสดงอาการเสียดท้องจากภาวะทางเดินอาหารอัดแน่น อย่างไรก็ตาม การรักษาทางการแพทย์แผนปัจจุบันเป็นที่ได้รับการยอมรับอย่างกว้างขวาง นอกจากนั้นในส่วนของการฝังเข็มนั้นเป็นที่น่าสนใจที่จะใช้เป็นอีกหนึ่งทางเลือกในการรักษาเชิงบูรณาการ เพื่อเพิ่มประสิทธิภาพในการรักษาให้ดีที่สุด และสัตว์ได้รับผลข้างเคียง หรือภาวะแทรกซ้อนน้อยที่สุด

คำสำคัญ: ม้า ภาวะเสียด การฝังเข็ม การรักษาเชิงบูรณาการ

Introduction

Intestinal impaction is one of the most common causes of colic in horse. Such condition is mainly a consequence of the dehydration of digestive system. There is no specific site of impaction but it typically affects any small-diameter parts of the intestines which are easy to be obstructed. Some examples of risky sites are the transition from the left ventral colon to the left dorsal colon, the transition from the right dorsal colon to the transverse colon and the ileal-cecal-colical orifice. Ischemia and/or necrosis can be undesirable effects from obstruction and it is considered as severe stage (Plummer 2009).

The obstruction of large colon and small colon are accounted for 13.4% (Dabareiner and White 1995) and 34% (Dart et al., 1992) of the colic cases in horse, respectively. Changing their routines within 2 weeks can increase the risk of colic (Dabareiner and White 1995). Lack of water is considered as a major risk for the development of large colon impaction together with decreasing exercise and increasing time in stable (Hillyer et al., 2002). Similarly, poor quality of roughage, poor dentition, lack of water, and motility disorders are believed to be risk factors of small colon impactions (Plummer 2009).

The treatment of colon impactions can be either medical or surgical depending on different situations and the severity of individuals (Frederico et al., 2006). The treatment is generally included rehydration as well as withholding feed until the detection of passing impacted contents. Analgesic drugs should be administered to be in line with the principle of animal welfare. In severe colic cases, surgery is necessary to save life (Plummer 2009).

The integration of acupuncture in veterinary field in particular equine medicine is rather new. The clinicians

who perform such technique should be specially trained in traditional Chinese diagnostic and treatment (Shmalberg and Xie 2009). The medical acupuncture for the treatment of gastrointestinal disorders mainly relies on the stimulation of somatovisceral connections which is the neural connection between cutaneous fiber (somatic) and the gastrointestinal tract (visceral) (Uchida and Hotta 2008). Moreover, the acupuncture has analgesic effects which help reduce pain in equine colic case (Skarda and Muir 2003). The application of acupuncture causes the generation of rhythmic electrical discharges in nerve fiber and induces the release of opioids and oxytocin. Those substances were potential to ameliorate the function of organ system (Andersson and Lundeberg 1995). There are several locations of transposition and classical acupoints indicated for the treatment of gastrointestinal disorders. For example, the impaction of large colon, small colon, cecum, rectum and small intestinal in horse can be cured by acupuncture; applying needle at BL-21 acupoint (Feng 1981). The purpose of this report is to present the diagnosis of impaction colic as well as the integration of dry needle acupuncture and conventional veterinary medicine for the treatment of impaction colic in horse.

History, Clinical Diagnosis and Findings

The veterinarian was informed by the local religious practice foundation about A 4-year-old, 239 kilograms, Thai native gelding with downcast, decreased-appetite, reduced water intake, and no defecation observed in 4 days. The clinician directly headed to that place because of the fact that the owner was not able to transport that horse to the veterinary hospital.

On the presentation, there were normal heart sound and breath sound together with no nasal and ocular

discharge. The clinical findings revealed hyperthermia (body temperature 102.2°F), tachycardia (heart rate 75 bpm), tachypnea (respiratory rate 35 bpm), and absent sound or lack of borborygmus from 4 quarters of the gut. The mucous membrane was salmon pink and capillary refilling time was more than 2 seconds with 8% dehydration (skin recoil > 3 seconds). The mental status of the horse was evaluated as depression with decrease responsiveness and appetite. In order to exclude sand colic, the clinician performed the test by mixing manure and water in a rubber glove, and no sandy sediment found after being left for few hours. The examination of fresh stool through light microscope showed large amount of fibers. The fecal appearances were firm and dry with dark color. Incomplete digestible fibers were remarkable in the feces. There were some limitations of rectal palpation examination in small horses due to their anxiety and intolerant. Therefore, it is difficult to complete the diagnosis with rectal palpation. The clinician decided to do nasogastric intubation in order to check stomach contents and the absent of gastric reflux (gastric emptying). Blood sample was collected and well preserved at 4°C for the evaluation of complete blood count and basic blood chemistry profile conducted in the following day. Most of the parameter was in normal range with the exception of leukopenia and monocytosis. The veterinarian did additional history taking with the horse keeper about feed and feeding. In fact, the horse keeper fed corn silage (bovine roughage) ad libitum feeding for more than a week instead of grass or hay. Then the horse showed colic signs which made him shifted bovine roughage to hay. However, the colic signs were not improved and it was tentative diagnosed as impaction colic.

Case management

The initial treatment for this horse based on intravenous rehydration with 19-liter Lactate's ringer solution. Non-steroidal anti-inflammatory drug (NSAIDs) (Flunixin meglumine: Fluximine®) was given intravenously accounting for 1.1 mg/kg/day, 1,000 µg of Cyanocobalamin (Catosal®) was given intramuscularly twice a week and intramuscular Penicillin with Dihydrostreptomycin (Pendistrep L.A.®) at the dosage of 22,000 iu/kg, alternately. Additional lubricant was provided for small colon and rectum through enema using chlorhexidine solution diluted with 3-5 liter of tap water. Another site was the upper gastrointestinal tract which was lubricated with 1 bottle (450 ml.) of liquid paraffin through nasogastric intubation and 3 liters of drinking water once a day.

After several days of treatment (3-5 days), the horse did not respond to the treatment. It was still unable to defecate with abnormal gut sound, but normally urinated. Therefore, the clinician made the decision to perform the treatment with dry needle acupuncture specific for gastrointestinal disorder every other day in combination with daily conventional veterinary medicine. The acupoints used in this treatment were the transpositional acupoints and the classical acupoints. The transpositional acupoints to be used were composed of ST-36 (*Hou-san-li*), SP-6 (*San-yin-jiao*), BL-20 (*Pi-shu*), BL-21 (*Wei-shu*), BL-49 (*Yi-she*), BL-50 (*Wei-cang*), GV-14 (*Da-zhui*), GV-1 (*Hou-hai* or *Chang-qiang*), CV-12 (*Zhong-wan*) (Xie and Trevisanello, 2007; Shmalberg and Xie 2009). The classical acupoints to be used were comprised of *Bai-hui* (Hundred Meetings), *Qi-hai-shu* (Sea of Qi), *Jiang-ya* (Ginger Bud), *Er-ding* (Ear Nail) (Xie and Yamagiwa 2007; Shmalberg and Xie 2009). The dry needle acupuncture length range 2.0-4.0-inch with diameter 0.25-0.30-mm

needles were used for this treatment and used insertion tubes to facilitate the insertion of filiform needles into tough skin and flesh (Ferguson 2007). The locations of acupoints are shown in table 1.

After the combination of treatments (conventional veterinary medicine and traditional Chinese veterinary medicine with dry needle acupuncture) the horse recovered with better vital signs, responsiveness and increase appetite. It was lively with normal gut sound and was able to defecate. The clinician decided to withdraw all the treatment at day 10 with followed up for a week after termination of the treatment. There was neither complication nor the recurrent signs of colic found in this case.

Discussion

The main cause of colic in horse is from what it consumes. The sudden change of feed was possible to shift the content of digestive tract which is considered as one of the risk factors of colic (Muhonen et al., 2009). Interestingly, even mixed types of feed e.g., various kinds of hay, were significantly associated with the occurrence (Cohen et al., 1999). The recurrence of colic was somewhat common in horses with history of colic or abdominal surgery (Hudson et al., 2001). Giving grain feed and excessive corn in hot weather had been associated with colic (Hintz 1984). High energy diet such as silage and haylage could lead some horses into trouble because of the fact that such feed provided excessive daily nutritional needs (Lindroth 2016) as well as harbored botulinum toxin from improper processing and storing (Skelly 2008).

Hydration status could be corrected by fluid replacement. The estimation of dehydration should be done by the clinician and then followed the calculation proposed by Hurcombe (2018) as shown below

$$\text{Volume (Liter's)} = \text{Body Weight (Kilograms)} \times \text{Percent of Dehydrated}$$

Blood lactate determination helped do prognosis in colic horse (Moore et al., 1976). If the concentration of plasma lactate was less than 6.0 mmol/L, the prognosis could be good (84% sensitivity and 83% specificity). On the other hand, surgery was needed in severe case when the concentration of plasma lactate was higher than 6.0 mmol/L (Johnston et al., 2007). However, blood lactate level monitoring should be considered of prognosis in the further colic case.

The major site of large colon impaction was where the luminal diameter decreased. The clinical signs varied depending on the severity of the impaction. Pain is generally mild to moderate (Plummer 2009). The horse with colic normally had the heart rate from 30 to 86 beats/min (median, 44 beats/min), (Dabareiner and White 1995) and most horses have decreased or absent gastrointestinal borborygmi. Transrectal palpation was used for general diagnosis of the impaction location at the pelvic flexure and the ventral colons (Plummer 2009). Rectal palpation was considered as the most reliable method for diagnosis. Unfortunately, there were some limitations such as it could not be used in small pony (Pierson et al., 1998) and in fractious horses. They will not tolerate during palpation and per rectal ultrasonography. Lubricant was useful and it prevented rectal mucosa from chapping or damaging during the examination (Sertich 2007). Medical treatment for large colon impactions was generally successful. The horse received fluids (intravenously) and non-steroidal anti-inflammatory medications or sedatives (Plummer 2009), including flunixin meglumine, xylazine hydrochloride, butorphanol and detomidine hydrochloride (Dabareiner and White 1995). Horses often responded to oral medications through nasogastric tubes with mineral

oil (1 gallon once a day) and magnesium sulfate (1 g/kg once a day for 2-3 days in 2 liters of water). Such technique could be used in horse that were not systemically dehydrated (Plummer 2009). The duration of medical treatment required to resolve the impaction ranged from 1 to 6 days (2 days as mean) (Dabareiner and White 1995). The most common complications of large colon impaction treatment were thrombophlebitis of the jugular vein and diarrhea (Rhoads et al., 1999).

The common clinical signs of small colon impactions were abdominal pain (mild to moderate), increased heart rate, decreased fecal waste (Ruggles and Ross 1991), lack of borborygmi, abdominal distention and decreased appetite (Rhoads et al., 1999). Additional signs included fever, depression, and nasogastric reflux. The clinical hematology values were usually within normal ranges; however, some horses showed leukopenia (Plummer 2009). Horses with small colon impaction were commonly consequence of colitis and were more likely to have diarrhea compared to those with large colon impaction (Frederico et al., 2006). The common complications of small colon impaction treatment included diarrhea, jugular thrombophlebitis, recurrent colic, fever, and laminitis during hospitalization (Rhoads et al., 1999). Furthermore, those horses surgically treated for small colon impaction were at 57% higher risk of salmonellosis. Additional treatments for small colon impaction included the use of antibiotics (penicillin and gentamicin) (Ruggles and Ross 1991). Nevertheless, antimicrobial treatment for salmonellosis in adult horse was controversial (Chandra and Kaur 2018).

As mention previously, both small and large colon impaction have common complications as diarrhea lead to secondary or bacterial infection (Rhoads et al., 1999). Therefore, the proper control of the infection depended on

the prevention of the secondary infection from bacteria through improvement in general hygiene (Chandra and Kaur 2018).

The clinical approach in Chinese veterinary medicine for gastrointestinal disorders included the group of points on the meridians of spleen and stomach. The Chinese descriptions of the digestive organs indicated that the spleen was believed to be responsible for the digestion and processing of food (Ouyang and Chen 2004).

The common points for any other gastrointestinal disorders included ST-36, SP- 6, *Qi-hai-shu*, BL-20, and BL-21, which were then called 'core point' (Shmalberg and Xie 2009). The application of acupuncture at GV-14 potentially diminished fever in the patients and traditionally associated with heat-clearing properties (Ling and Zhao 2006). *Er-ding* was an acupoint which was traditionally used for equine colic treatment. The CV-12, known as 'alarmpoint' for the stomach, could exhibit visceral analgesic effect. A 1.5-inch dry acupuncture needle was recommended for a perpendicular insertion. The classical *Jiang-ya* acupoint had analgesic effects and helped differentiate between medical and surgical colic when there were other non-specific signs shown (Shmalberg and Xie 2009). The application of acupuncture at GV-1 had analgesia effects on both hypermotility and hypomotility which contributed to clinical responses in horses. That acupoint seemed to be able to normalize gastrointestinal motility (Kim et al., 2006). In addition, GV-1 posed an anti-inflammatory effect on alleviating colonic lesions and decreasing myeloperoxidase activity (Kim et al., 2005). Such effect was shown through leukocyte especially neutrophil which was related to the immune system and phagocytosis (Klangprapan et al., 2013). The application of

Table 1. The location of Transpositional and Classical Acupoints indicated for the treatment of gastrointestinal disorders

Acupoints	Anatomic Location
ST-36	0.5 cun lateral to the cranial aspect of the tibia crest, over the cranial tibialis muscle
SP-6	3 cun proximal to medial malleolus, caudal to the tibial border
BL-20	At the 17 th intercostal space, 3 cun lateral to the dorsal midline in the iliocostal muscle groove
BL-21	Caudal to the last rib, 3 cun lateral to the dorsal midline in the iliocostal muscle groove
BL-49	3 cun lateral to BL-20
BL-50	3 cun lateral to BL-21
GV-14	In the depression along the dorsal midline at the cervicothoracic intervertebral space
GV-1	In the depression between the anus and the ventral aspect of the tail
CV-12	4 cun cranial to umbilicus
<i>Bai-hui</i>	On dorsal midline at the lumbosacral space, in the depression between the spinous processes of the last lumbar and the first sacral vertebrae
<i>Qi-hai-shu</i>	In the groove between the longissimus-dorsi and the ilio-costalis muscles at the level of the 16 th intercostal space
<i>Jiang-ya</i>	Alar cartilage at the lateral corner of the nostril
<i>Er-ding</i>	In a depression at the rostral end of the ear base

Cun: The length of one-finger cun is equal to the wider of the practitioner's index and middle finger at the joint of the middle phalanges (Xie and Preast 2007).

Table 2. The general indication of Transpositional and Classical Acupoints.

Acupoints	Indication
ST-36	Master point for GI tract and abdomen, <i>He-sea</i> point (earth). Nausea, vomiting, stomach pain, gastric ulcer, food stasis, general weakness, constipation, diarrhea
SP-6*	Master point for the caudal abdomen and urogenital tract, tonifies <i>Qi</i> and blood. Diarrhea, genital discharge, promotes parturition, infertility, paralysis of hind limb, impotence, abnormal cycling, hernia, urinary incontinence, insomnia
BL-20, BL-49	Back- <i>shu</i> association point for SP (traditional association point for LI); vomiting, diarrhea, edema, back pain, jaundice, abdominal fullness
BL-21, BL-50	Back- <i>shu</i> association point for ST, promote GI motility, relieve colic pain; diarrhea, colic, constipation, vomiting
GV-14	Fever, cough, heaves, sweat, cervical stiffness, skin rash, seizure
GV-1	<i>Luo</i> -connecting point of the GV Channel; diarrhea, bloody defecation, constipation, perianal problems, seizure
CV-12	Alarm point for stomach, influential point for <i>Fu</i> organs; gastric ulcer, diarrhea, jaundice, vomiting
<i>Bai-hui</i>	Hind quarter pain, hind quarter paralysis, hip arthritis, contusion, colic, gaseous bowel, diarrhea, wind pattern, <i>Yang</i> deficiency, overexertion
<i>Qi-hai-shu</i>	Exhaustion, <i>Qi</i> deficiency, general weakness, poor performance, gaseous bowel
<i>Jiang-ya</i>	Colic. It will most likely be a surgical colic if pain is not relieved within 15 minutes after the acupuncture treatment at <i>Jiang-ya</i> point.
<i>Er-ding</i>	Impaction, spasmodic colic, gastric dilation, and indigestion

(*) *Cautions: Contraindicated during pregnancy and dangerous from kick by a horse*

acupuncture at ST-36 could enhance intestinal peristalsis through cholinergic (Luo et al., 2008) and endocrine pathways (Shmalberg and Xie 2009). The general indications of acupoints were shown in table 2 (Xie and Trevisanello 2007; Xie and Yamagiwa 2007). The use of dry needle provided more benefits than the electroacupuncture because the electroacupuncture was contraindicated in the conditions of heat such as acute inflammation or hyperthermia (Shmalberg and Xie 2009).

The acupuncture had long been applied as treatment in China for several millennia with increased acceptance among practitioners worldwide. The goals of all treatment were to maximize the treatment effectiveness and to minimize any complications from the treatment. Although the conventional veterinary medicine had been accepted worldwide, the acupuncture was notability and could be another option for integrative medicine.

However, this is the first report that combines two methods of integrative treatment. We cannot conclude that conventional veterinary medicine combined with traditional acupuncture can be used as an indication for treatment tool, because of the lack of insufficient samples. We also do not know if the horse recovered by conventional medicine or traditional acupuncture. We hope that in the future, we will conduct studies for statistical significance, and veterinarians will be able to use it as a treatment tool for another option in integrative medicine.

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