

ASSESSMENT OF THE PRACTICAL RESPONSE TO TREATING COLIC WITH ACUPUNCTURE IN ARABIAN HORSES

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ABSTRACT

The research was conducted on /145/ Arabian horses, that suffered from abdominal visceral pain (colic), in Syria from the Equestrian clubs and Private stables in the governorates of Homs, Hama, and Damascus country-side, for the period of October 2019 till the end of March 2022. The horses were subjected to a dry-needling and an aqua-acupuncture technique through the acupoints map for /30/ minutes session. The cases were classified according to the colic type; spasmodic colic, flatulent colic, impactive colic, obstructive colic, and colic with displacements of intestine. This was done to record the practical response of acupuncture for treating colic in Arabian horses. The results of this study showed the efficiency of acupuncture sessions in treating colic of Arabian horses, and the benefit of sharing acupuncture with the traditional method of treating colic. The last procedure increases recovery rates, and speed up recovery in comparison with treating in each method alone.

Keywords: *Acupuncture - Colic– Arabian Horses.*

INTRODUCTION

Colic in horses is defined as abdominal Visceral Pain, which often occurs due to digestive disorders, it presents with mild to severe symptoms (John *et al.*, 2009). And colic is a common emergency case that requires rapid treatment (Clarke *et al.*, 1990). Because it is a major cause of horse death, research has shown that about 20% of colic

cases are critical, and require intensive emergency medical care or surgery (Cohen, 1997), so colic is a source of fear for horse owners (Curtis *et al.*, 2019).

Horses are relatively sensitive animals to colic due to the anatomical structure of their digestive system (Cohen and Peloso, 1996). The true colic varies according to the causes, it may be spasmodic colic, flatulent colic, impactive colic, obstructive colic, and colic with displacements of intestine (Cohen *et al.*, 2000; Kaneene *et al.*, 1997; Scantlebury *et al.*, 2014). Sometimes colic is false, because of bladder stones, ovarian problems, etc., and this is known as false colic (Hewetson, 2006).

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Mild digestive colic in horses usually presents with moderate signs of pain. It notes lip curling, flank watching, restlessness, lack of appetite, and pawing the ground. While in moderate cases, it takes the position of urinating frequently, lying down and getting up recurrently, or lying on the side for long periods, and some horses take the position of the dog sitting, and the belly appears bloated and more rounded than usual. In severe cases, its violent rolling, sweating, and rapid breathing (Cohen *et al.*, 1999; Proudman *et al.*, 1998; Pugh and Thompson, 1992).

Western veterinary medicine (WVM) and Traditional Chinese veterinary medicine (TCVM), are two medical systems which are not contradictory (Liu *et al.*, 2010). According to TCVM, the body is an integrated energetic structure, and disease is an imbalance in these body, when disturbance of energy flow creates disease. When one identifies a disease pattern, he can restore balance and health by helping the body regulate itself, so TCVM practitioner may recommend herbs or acupuncture as a therapy for diseases (Xie and Preast, 2007).

Acupuncture offers an additional approach to therapeutic dilemmas that may not respond to conventional medicine (Schoen, 2000). And it has been practiced for thousands of years, and it's one of complementary treatment in equine practice, that used to treat equine diseases through induce self-healing (Pellegrini *et al.*, 2018), and its efficient ways for pain relief (Alvarez, 2015).

Acupuncture is defined as a technique of inserting needles through the skin at specific points (acupoints), for that are stimulated, and cause changes in different biochemical parameters, to cure disease, relieve pain (Saad, 2011; Williams, 2013; Yu, 1995).

Since 1949, many acupuncture techniques have been developed, such as dry-needling using filiform needles, aqua-acupuncture that acupuncture with the injection of certain substance such as saline solution / 0.9% / or a

local anesthetic solution or vitamin B12, electro-acupuncture, laser acupuncture stimulation, and magnetic acupuncture (Grognet, 2007; White and Ernst, 2004). The basic principles of acupuncture based on correcting the flow of chi (Qi) or vital force. and the therapeutic effects of acupuncture are shown by stimulating neural-hormonal pathways (Grognet, 2007; Ramey, 2000).

Acupuncture treatment has been used to treat a variety of diseases, as it has shown its effectiveness in relieving pain in horses (Schoen, 1994). Among of the conditions associated with pain in horses are colic and musculoskeletal affections that cause lameness (Xie *et al.*, 1996; Zhou, 1992). Acupuncture has an analgesic effect when beta-endorphins are released (Xie *et al.*, 2001). Clinical studies have shown that acupuncture speed up to recovery from injuries by stimulating blood circulation (Hartwigsen, 2021; Ridgway, 2005), and activation of the anti-inflammatory cholinergic pathway which aids to treat the digestive disorders (Tangjitjaroen *et al.*, 2009). The acupuncture analgesia mechanism is demonstrated by the microscopic injury caused by insertion of the needles, which stimulates the local inflammatory response at the site by releasing tissue hormones such as bradykinin, histamine, and serotonin (Schoen, 1994). also causes activation of the descending pain inhibitory pathway which reduces or raises the threshold for pain (Robinson, 2007).

Early diagnosis, identification of the colic pattern, and the application of emergency treatment and appropriate medical care are a means of speeding recovery and increasing survival rates (Blikslager *et al.*, 2017).

The aim of work is to present the applied results of combining acupuncture with traditional veterinary medicine for the treatment of colic and compare the recovery rates, and speed of recovery when treating in each method alone.

MATERIAL AND METHODS

1- Animals of the study:

The research was conducted on /145/ Arabian horses, that suffered from abdominal visceral pain (colic), in Syria from equestrian clubs and private stables in the governorates of Homs, Hama, and Damascus countryside between October 2019 until the end of March 2022.

The horses were healthy, except for emergency colic that occurred, and they were subjected to treatment with acupuncture technique, or traditional method of treating, or a combination of the two methods. The cases were distributed according to colic type; spasmodic colic (SC), flatulent colic (FC), impactive colic (IC), obstructive colic (OC), and colic with displacements of intestine (DC). And their proportions were as shown in chart No. (1).

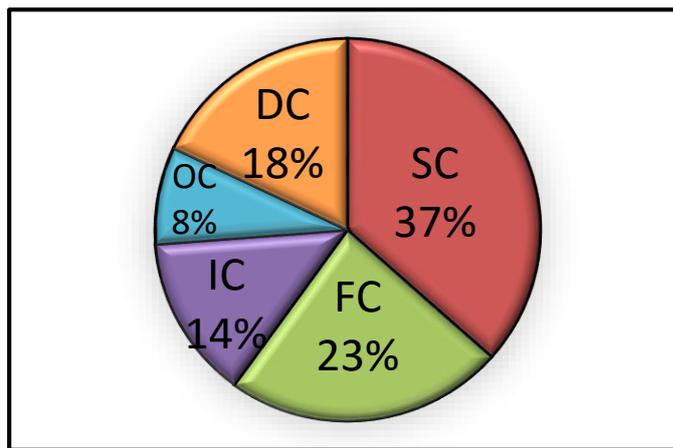


Chart No. (1) Shows the percentages of cases distribution according to the colic type.



Figure No. (1) Shows Acupuncture needles.

2- Equipment used:

- Acupuncture needles of different sizes 0.70 x 70 mm, 0.50 x 50 mm, Injection needles size 18G, and spinal needle 25G x 3 1/2.
- Obaracaine® (lidocaine Hcl 2%, OUBARI PHARMA - Syria), and Metran® (vitamin B12 500 mg, Daewon – Korea) for Aquapuncture.
- Metalgen® (Noramidodopyrone - Alshark vet - Syria), Flunixin® (Norbrook – Ireland), Buscopan® (N-Butylscopolamine bromide - Boehringer Ingelheim Animal Health - UK), Xylazine® 10% (Alfasan International BV, Netherlands), Ringer IV solution (miamed® - Syria) and Liquid Paraffin.

3- search steps:

- Clinical examination: Which included assessment of rectal temperature, heart

rate/min, respiratory rate/min, capillary refilling time/s, and evaluation of gastrointestinal motility activity by auscultation.

- Diagnosis of the type of colic.
- Treating colicky horses using acupuncture, traditional treatment, or a combination of acupuncture with traditional treatment.
- Recording the results of the response to treatment by following up on the improvement of its behavior, the decrease

in the intensity of pain and its return to its normal state.

4- The selected colic Acupoints:

A tsun (cun) measurements was used for locating points in these horses. One cun equal the width of two fingers (about 3 cm). Two cun equal the width of four fingers (about 6 cm); according to (Xie and Preast, 2007).

All the selected acupoints mentioned in the this work are inverted from (Schoen, 1994; Xie and Preast, 2007), and the locations of used acupoints are shown in table No. (1).

Table (1): Shows the acupoints locations.

Acupoints	Anatomic location
<i>Bai-Hui</i>	single acupoint, on dorsal midline at the lumbosacral space, in the depression between the spinous processes of the last lumbar and the first sacral vertebrae, under the acupoint is the supra-spinal ligament.
BL-23 (<i>Shen-Shu</i>)	bilateral acupoint at 6 cm lateral to Bai-hui acupoint, under the acupoint is gluteus medius muscle.
GV-2 (<i>Wei-Gen</i>)	single acupoint, in the depression between the 1st and 2nd coccygeal vertebrae on the dorsal midline, the acupoint is between the bilateral sacro-coccygeus medialis muscle.
GV-1 (<i>Wei-Ben</i>)	single acupoint, on the ventral surface of the tail, 6 cm caudal to the base of the tail and on the level of middle coccygeal vein.
<i>Shen-Jiao</i>	a bilateral acupoint at 2 cun caudal to BL-23 acupoint.
<i>Shen-peng</i>	bilateral acupoint, it is at 2 cun cranial to BL-23 acupoint, under the acupoint is the gluteus medius and longissimusdorsi muscles.
<i>Wei-Ben</i>	a single acupoint, on the ventral surface of the tail, 6 cm caudal to the base of the tail and on the level of middle coccygeal vein.
TH-1 (<i>Qian-Ti-Tou</i>)	a bilateral acupoint in 1 cun lateral to the dorsal midline of the toe, 1 cm dorsal to the periople or the junction between the coronary border of the hoof and the skin
ST-45 (<i>Hou-Ti-Tou</i>)	a bilateral acupoint at the dorsal median line of toe, 1cm dorsal the periople or junction between the coronary border of the hoof and skin.



Figure No. (2): Shows the places where needling in some acupoints.

5- Technique of acupuncture:

- Dry-needling to stimulate the acupoints; ST-45, TH-1, and Wei-Ben.
- Aqua-acupuncture by injection 2 ml of Obaracaine[®] (local anesthetic) into acupoints; Bai-Hui and GV-2, and injection 4 ml of Metran[®] (Vit B12) into acupoints; BL-23, Shen-Jiao, and Shen-Peng.

6- Technique of traditional treatment of colic:

Traditional treatment includes the application of appropriate drugs according to the colic type and the severity of symptoms. The researcher (Radostits *et al.*, 2007) refers to the main steps used in treatment, which include:

- Reducing pain by excluding the cause that led to increase tension in digestive system, as in flatulent and impactive colic, so we do nasogastric intubation to check the stomach contents and gastric evacuation and lavage if it's needed, and pass /1.5 – 3/ liters of liquid paraffin.
- Pain relief with analgesics and NSAIDs; Metalgen[®], Flunixin[®], and Xylazine[®].
- Maintaining normal intestinal motility; Improving them when they are inactive or absent by using stimulants of movement as Neostigmine, while in case of increased activity of gastrointestinal cramps give antispasmodics such as Buscopan[®].

- Correction of rehydration: by compensation it with saline or Ranger intravenous solutions at a rate of /5-12/ liters, every /6-12/ hours according to the degree of dehydration.

- Complementary treatment: by warming the horse, fasting while allowing drinking water in moderate amounts, light gait for /10-15/ minutes every /1-2/ hours, return to the diet gradually, and giving antihistamines to avoid laminitis.

STATISTICAL ANALYSIS

The results were expressed through the percentage of cure and mortality rates, and distribution of cured cases according to speed up recovery (30 min, 6 hours, 24 hours), and statistical calculations were performed using SPSS[®] Statistics - version /26/ (Corp, 2019), and we drew the charts using Excel version 2013.

RESULTS

Signs of recovery in colicky horses include several manifestations; demise or decrease in pain, return of appetite for feed, and return response to external stimuli and owner's. The results showed a 100% improvement in all cases of spasmodic colic for all treatment methods. traditional treatment, acupuncture, or a combination of both. On the other hand,

the recovery speed varied according to the different method of treatment. The highest recovery rate 73.9% was obtained within /30/min, using the combined treatment method between the acupuncture with

traditional treatment, compared to its values when using acupuncture method alone 64.3%, or traditional method alone 37.5%, as shown in chart No. (2).

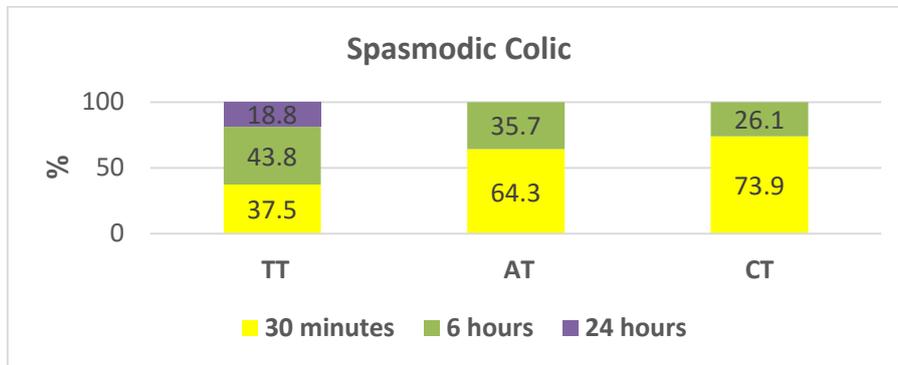


Chart No. (2): Shows the percentages of recovery speed in spasmodic colic.

While the recovery rate from flatulent colic varied according to the treatment method, it was the lowest when using acupuncture alone 66.7%, while in the traditional treatment method 81.8%, and all cases were cured when combined treatment method, as shown in

chart No. (3). It was also the highest recovery rate within /30/min when treatment by combination method 82.4%, compared with the percentage obtained by the acupuncture treatment method 50%, and traditional method 54.5%, according to chart (4).

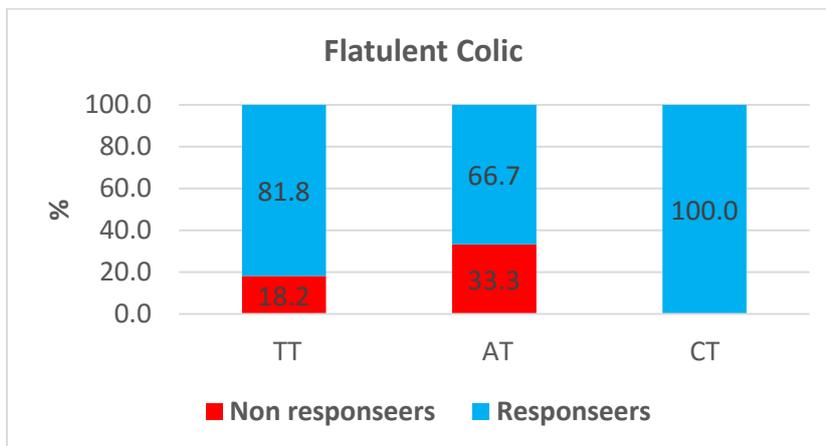


Chart No. (3): Shows the percentages of recovery and mortality in flatulent colic.

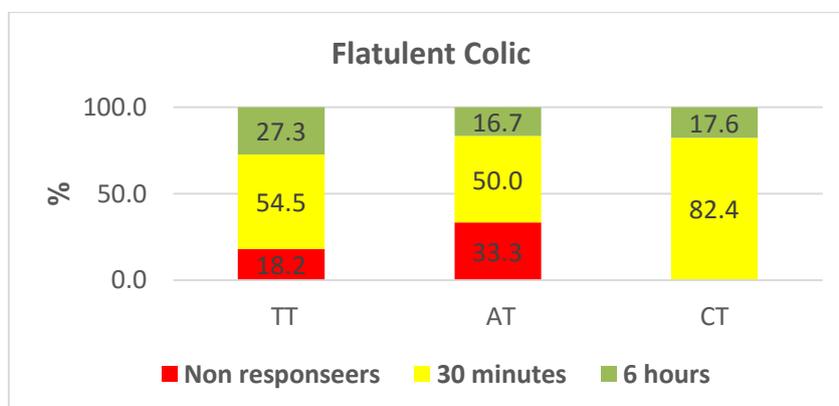


Chart No. (4): Shows the percentages of recovery speed in flatulent colic.

The recovery rate for impactive colic also varied according to the treatment method. The lowest was the traditional method 50%, while the acupuncture 57.1%, and the highest when the therapeutic combination between acupuncture and the traditional method that reached to 85.7%, as shown in chart (5).

The improvement in cases began within 30 minutes when using the acupuncture method

or the participation method, and the percentage in each method was 14.3%, in contrast, no improvement appeared in the cases in the first half hour in the cases when treatment by traditional method alone. Most of the cases were cured within /6/ hours by combined treatment 57.1%, while the recovery rate within /24/ hours 33.3%, and mortality 50% when applying the traditional treatment. As shown in chart No. (6).

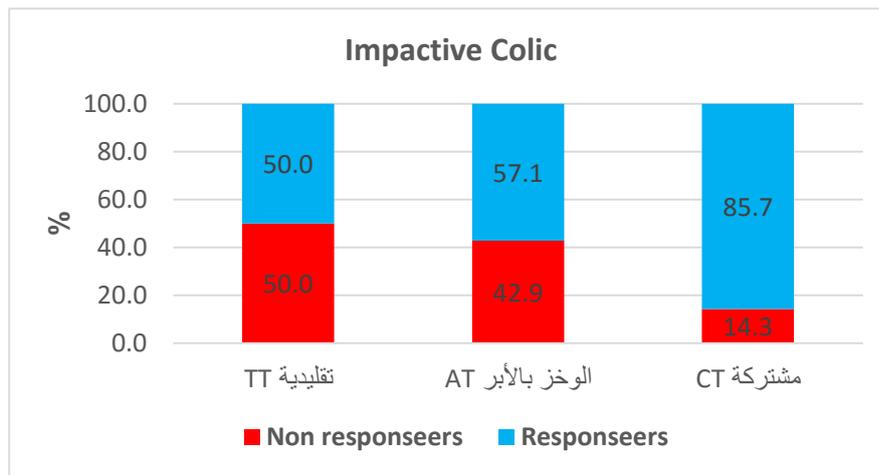


Chart No. (5): Shows the percentages of recovery and mortality in impactive colic.

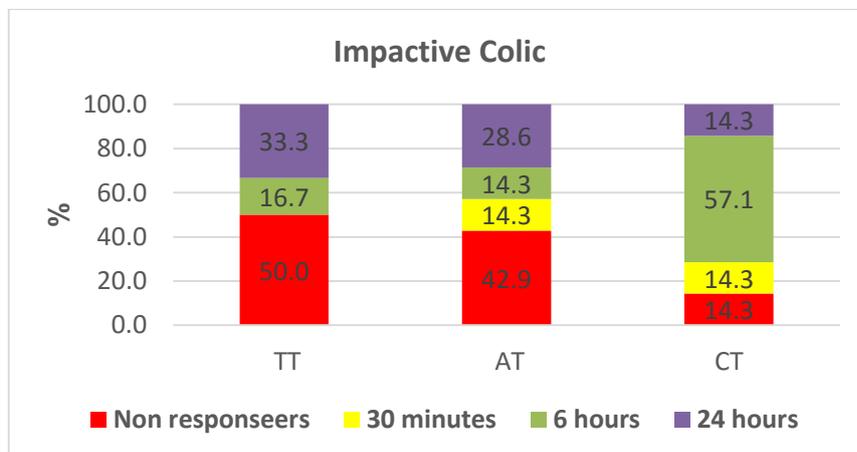


Chart No. (6): Shows the percentages of recovery speed in impactive colic.

Horses with obstructive colic had recovery rate 66.7% when treated by combined method, while cure rate only 33.3% when traditional treatment alone, as shown in chart No. (7).

The recovery rate was 33.3% during /6/ hours and the same percentage during /24/ hours with combined treatment, while the rate was 16.7% when the traditional treatment alone was during /6/ hours and during /24/ hours, as shown in chart No. (8).

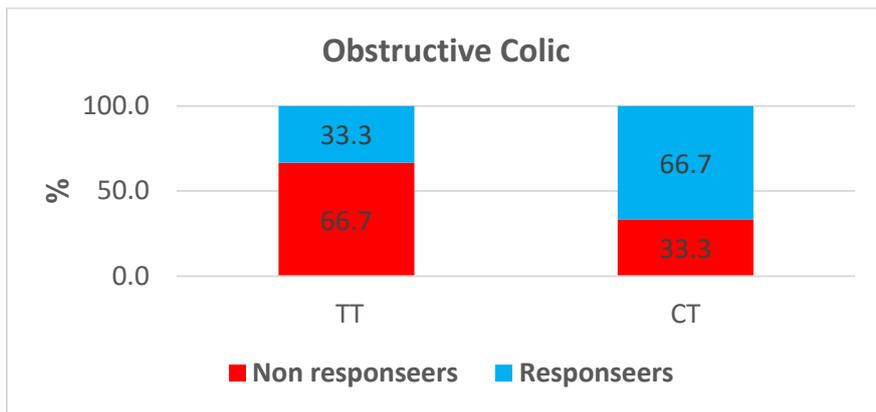


Chart No. (7): Shows the percentages of recovery and mortality in obstructive colic.

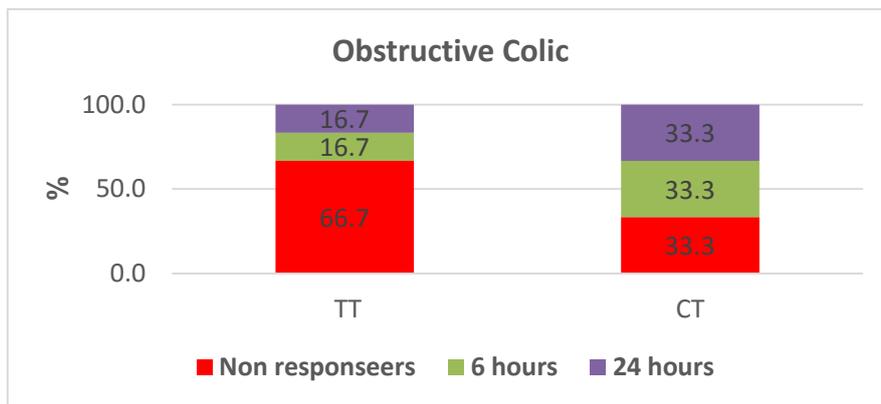


Chart No. (8): Shows the percentages of recovery speed in obstructive colic.

As for colic caused by displacements of Intestine, the mortality rate was 100% when treated with the traditional method, compared

to the combined treatment, The recovery rate was 10.5%, which appeared within 24 hours of treatment, as shown in chart No. (9)

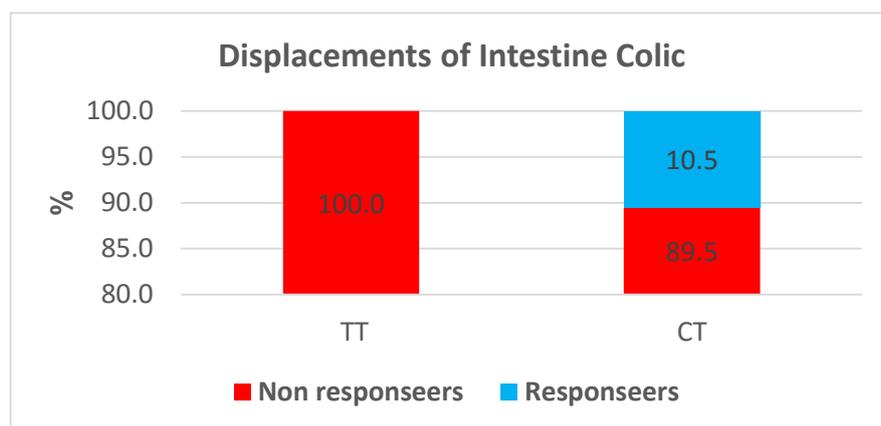


Chart No. (9): Shows the percentages of recovery and mortality in intestine displacement colic.

The acupuncture sessions in horses which showed improvement within /30/ minutes, were accompanied by some behaviors such as; continuous movements in the mouth after about /10/ minutes from begin of the session, followed by the expulsion of gases through

the rectum, and expulsion of quantities of feces after /15-30/ minutes from the beginning of the session, which coincided with return of the intestinal movements that were revealed by auscultation.



Figure No. (3): Shows some symptoms of colic.
 A: depression, B: conjunctival congestion, C: sweating.



Figure No. (4): Shows some symptoms of colic. A: flank watching, B: pawing the ground.



Figure (5): Shows acupuncture session with traditional treatment.

DISCUSSION

One of the most important risk factors for colic in horses is the feed they eat, as the sudden change in nutrition leads to a change in the content of the digestive system, as well as the sudden intake of large quantities of feed (Muhonen *et al.*, 2009), in addition to

sudden changes in the weather, internal parasites have a role in the occurrence of obstructive colic in young horses, and colic symptoms may develop severely and intestinal displacements occur (White, 2006). Other risk factors for colic include lack of water intake, poor fodder, lack of exercise, and dental problems (Hillyer *et al.*, 2002;

Plummer, 2009). It is the same as the causes of colic in study horses.

Symptoms similar in all type of colic; are irregular and high heart rate, irregular breathing movements, absence or lack of peristalsis movement. With the development of symptoms, observed the congestion of the mucous membranes, capillary refill time increased for more than two seconds, dehydration increased also, lack of appetite or anorexia, associated with signs of depression, and the main symptom is pain that ranges from moderate to severe pain (White, 2006). These are the symptoms observed during a thorough clinical examination of research horses.

generally, traditional treatment includes the administration of analgesic drugs, rehydration correction, in addition to laxatives such as liquid paraffin or laxatives such as magnesium sulfate orally through the nasogastric tube, as well as preventing feeding until the condition improves (Plummer, 2009), and this is what was adopted in the traditional treatment protocol in our study. Whereas in cases of severe colic, surgery is necessary to save life (Frederico et al., 2006). The duration of medical treatment of colic cases until the cases comply with recovery ranges from 1 to 6 days (Dabareiner and White, 1995). The survival rate of colicky horses is 50%, and this percentage includes simple colic up to cases of intestinal suffocation due to various displacements (Boles, 1975; White, 1986). This percentage has increased with the development in surgical techniques and the experience of surgeons (White, 2006).

Despite the success of traditional medicine in treating horse colic, it is associated with side effects, with the great importance of using analgesics such as flunixin meglumine because, for analgesic and anti-endotoxin effect, but it has harmful effects such as activating gastric ulcers, and inhibiting the mucosal barrier function (Campbell and Blikslager, 2000).

Acupuncture in the treatment of gastrointestinal disorders mainly relies on the stimulation of somatovisceral pathways which is the neural connection between cutaneous fibers and the digestive system (Uchida and Hotta, 2008). In addition to the analgesic effect of acupuncture, which reduces pain in colicky horses under the influence of endogenous opioids (Skarda and Muir III, 2003).

Acupoints maps for gastrointestinal disorders included of points follow to the meridian of the spleen as SP-6 and stomach as ST-36 (Ouyang and Chen, 2004). In addition to other points such as Qi-hai-shu, BL-20 and BL-21 (Shmalberg and Xie, 2009). The main acupoint is Bai-Hui, which is commonly used to treat colic in horses (Xie and Preast, 2007), The application of acupuncture at GV-1 Acupoint has an analgesic effect and regulates the gastrointestinal motility, which contributes to the improvement of colic in horses (Kim *et al.*, 2005). The application of acupuncture at ST-36 Acupoint improves intestinal peristalsis by activating the cholinergic and hormonal pathways (Luo *et al.*, 2008). These acupoints are the same or close to the acupoints used in our study, which confirm the effectiveness of the acupoints and their pathways in correcting digestive disorders in horses.

when combination of acupuncture with traditional treatment, there is an improvement in vital signs, increase appetite, and return intestinal peristalsis, and the excretion good amounts of feces (Srionrod, 2021). This is in agreement with our study, as our results showed a higher recovery rate if both methods were combined in treatment.

A common complication of long-term traditional treatments for colic is the development of diarrhea and thrombophlebitis of the jugular vein, which are much reduced when combined with acupuncture (Rhoads *et al.*, 1999; Shmalberg and Xie, 2009).

The acupuncture sessions in horses which showed improvement were accompanied by continuous movements of the mouth /10/ minutes after the start of the acupuncture session, followed by the expulsion of gases through the rectum, and expulsion of quantities of feces after /15-30/ minutes from the beginning of the session, which coincided with the activity of the peristaltic movements of the intestines were revealed by auscultation, and this is consistent with researcher (Schoen, 1994), who attributed it to the effect of systemic opioids that are released as a result of acupuncture, where opiate receptors are located in the gut, and when stimulated it stimulates movement The intestines, which leads to the excretion of gases and feces.

Based on the foregoing, it is concluded that the treatment of colic by acupuncture method is a complementary treatment worthy of interest, and it can be combining with traditional treatment to increase its effectiveness and avoid side effects, because of its importance in increasing the rates and speed of recovery in colicky Arab horses.

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تقييم الاستجابة التطبيقية لمعالجة المغص بالوخز بالإبر عند الخيول العربية

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الملخص

أجري البحث على/145/ رأس من الخيول ذات السلالة العربية الأصيلة، والتي تعاني من الألم البطني الحشوي (المغص)، في سورية حيث كانت تتبع لأندية الفروسية وبعض الإسطبلات الخاصة في كل من محافظة حمص، وحماه، وريف دمشق،

وذلك في الفترة الممتدة ما بين شهر تشرين الأول من عام (٢٠١٩) حتى نهاية شهر آذار لعام (٢٠٢٢)، وقد خضعت هذه الخيول لتقنية الوخز بالإبر الجاف والرطب من خلال خريطة من نقاط الوخز، ضمن جلسة استغرقت مدتها /٣٠/ دقيقة، بغية مقارنة النتائج التطبيقية للمعالجة بالوخز بالإبر عند الخيل العربية الأصيلة التي تعاني من ألم المغص مع المعالجة التقليدية.

وتوزعت الحالات وفق نماذج المغص؛ المغص التشنجي والمغص الغازي، والمغص الانحشاري، والمغص الإنسدادي، والمغص بإنزياحات الأمعاء.

وقد أوضحت نتائج الدراسة عن وجود فائدة تطبيقية من مشاركة الوخز بالإبر مع الطريقة التقليدية في معالجة المغص عند الخيول العربية الأصيلة، فقد ارتفعت نسب الشفاء وكانت سرعة التماثل للشفاء أكبر من نسبتها في المعالجة بكل طريقة بمفردها.

الكلمات المفتاحية: الوخز بالإبر – المغص – الخيول العربية الأصيلة.