

The anti-emetic Effect of Needling Acupuncture, Aquapuncture and Moxibustion at BL-21 and CV-12 in Xylazine Induced Vomiting of Dogs

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Abstract: The present study was made in order to clarify the anti-emetic effect by needle-acupuncture (AP), injection-AP and moxibustion in xylazine-induced vomiting of dogs. Twelve mongrel dogs (4 months to 5 year old, 2 to 4 kg of body weight), eleven mongrel dogs (4 months to 5 years old, 2 to 10 kg of body weight) and twelve mongrel dogs (4 months to 1 year old, 2 to 4 kg of body weight) were used for clarification of anti-emetic effect by needle-AP, injection-AP and moxibustion, respectively. The experimental animals were divided into control(6 heads), BL-21(6 heads), CV-12(6 heads) and BL-21+CV-12(6 heads) groups using total 6 dogs with vomiting selected in preliminary experiment, respectively in needle-AP treatment. In addition, the experimental dogs were divided into control (11 heads), BL-21 (6 heads) and CV-12(6 heads) groups using 11 dogs, respectively in injection-AP treatment. In moxibustion treatment the experimental dogs were divided into control (6 heads), BL-21(6 heads) and CV-12(6 heads) groups using 6 dogs, respectively. Five days after the experiment of one group was finished, the other group was examined in each experiment. Acupuncture needle was maintained for 20 minutes in needle-AP treatment. Metoclopramide was used in injection-AP treatment. Commercial moxa was used in moxibustion treatment. Vomiting was induced by intramuscular injection with 2% xylazine 20 minutes after treatments of needle-AP, injection-AP and moxibustion, respectively. The vomiting rates of BL-21(33.3%), CV-12(50%) and BL-21+CV-12(33.3%) were lower than that of control(66.7%) and vomiting times of experimental groups were similar to that of control in needle-AP treatment. The vomiting rates of BL-21(0%) and CV-12(16.4%) were lower than that of control(66.7%) and the vomiting time of CV-12 group was similar to that of control group in injection-AP treatment. The vomiting rates of BL-21(33.3%) and CV-12(33.3%) were lower than that of control (66.7%) and vomiting times of experimental group were similar to that of control group in moxibustion treatment. In conclusion, it was considered that needle-AP, metoclopramide injection-AP and moxibustion at BL-21 and CV-12 were effective for anti-emesis in xylazine induced vomiting of dogs and metoclopramide injection-AP was the most effective method for anti-emesis among them.

Keywords : needle-acupuncture, injection-acupuncture, moxibustion, BL-21, CV-12, dogs.

Introduction

Vomiting is a symptom which is caused by gastrointestinal diseases (gastritis, enteritis and gastrointestinal obstruction etc.) and non-gastrointestinal diseases(pancreatitis, renal failure, hepatic dysfunction, drugs and central nervous disturbance etc.), and severe vomiting can cause dehydration and electrolyte disturbance^{3,14}.

Infusion therapy for prevention of dehydration, sedatives, narcotics and antiemetics are used for the treatment of vomiting^{3,14}, however, alternative medicine including acupuncture treatment became the object of attention in recent veterinary clinical practice¹³.

It is well known that traditional oriental medicine (TOM) has therapeutic effects in human and animal diseases⁵⁻⁹. Acupuncture therapy is classified into needle acupuncture (needle-AP), injection acupuncture(injection-AP or Aquapuncture), laser acupuncture(Laser-AP) and electro-acupuncture(EA) etc.^{1,2,6}.

As for the anti-emetic effect of needle- AP in small animal

clinical practice, Kim¹³ reported that the anti-emetic effect of Weishu(BL-21) and Neiguan(PC-6) had better anti-emetic effect than that of control and also BL-21 had better anti-emetic effect than that of PC-6 in xylazine induced vomiting of dogs.

In addition, the therapeutic effects of injection-AP including hepatic recovery with saponin¹⁸ and hepatonics (taurine) at BL-18 were described, respectively. However, the anti-emetic effect by injection-AP in small animal practice has not been investigated yet.

On the other hand, It was reported that moxibustion therapy had therapeutic effects in diseases of digestive system, genital and cardiac diseases in human^{1,5,11,15,16}, however, therapeutic effect on disease of bovine digestive system, gastrointestinal movement of rats¹¹ and the effect on blood coagulation system by moxibustion were investigated in veterinary clinical practice. However, the anti-emetic effect by moxibustion was not examined up to now.

Therefore, the anti-emetic effects by needle-AP, metoclopramide injection-AP and moxibustion were investigated in order to clarify the anti-emetic effect on BL-21 and CV-12 in xylazine-induced vomiting of dogs.

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Materials and Methods

Experimental animals

Twelve mongrel dogs (4 months to 5 year old, 2 to 4 kg of body weight), eleven mongrel dogs (4 months to 5 years old, 2 to 10 kg of body weight) and twelve mongrel dogs (4 months to 1 year old, 2 to 4 kg of body weight) were used for clarification of anti-emetic effect by needle-AP, injection-AP and moxibustion, respectively. The experimental animals were divided into control(6 heads), BL-21(6 heads), CV-12(6 heads) and BL-21+CV-12(6 heads) groups using total 6 dogs with vomiting selected in preliminary experiment, respectively in needle-AP treatment. In addition, the experimental dogs were divided into control (11 heads), BL-21 (6 heads) and CV-12(6 heads) groups using 11 dogs, respectively in injection-AP treatment. In moxibustion treatment the experimental dogs were divided into control (6 heads), BL-21(6 heads) and CV-12(6 heads) groups using 6 dogs, respectively. Five days after the experiment of one group was finished, the other group was examined in each experiment

Needle-AP Treatment

The examined acupoints were BL-21(both tips of the transverse process of the first lumbar vertebrae) (Fig 1) and CV-12(midpoint between xyphoid and umbilicus)(Fig 2), respectively in the present study. Acupoint detector (Ittorator, Itto Electric Co., Japan) was used for detection of correct acupoints. General acupuncture needle (Hangrimseowon, Korea) was used for needle-AP. Needling time was maintained for 20 minutes in control and experimental groups. Control group was intramuscularly administered only with 2% xyla-

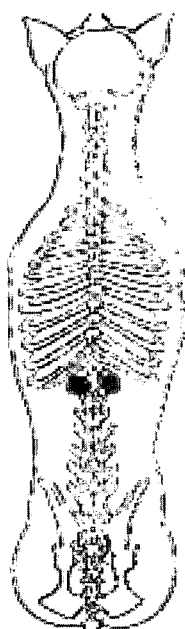


Fig 1. BL-21(both tips of the transverse process of the first lumbar vertebrae).

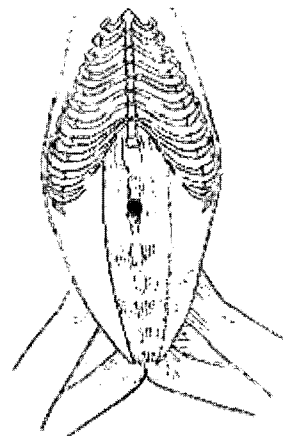


Fig 2. CV-12 (midpoint between xyphoid and umbilicus).

zine. Experimental groups were administered with xylazine 20 minutes after AP treatment.

Injection-AP Treatment

Metoclopramide(Zeslong[®], Jaeil Bio, Korea, 1 mg/kg) was injected into BL-21 and CV-12, respectively in injection-AP. Control group was intramuscularly injected with only 2% xylazine. In experimental groups, half volume of metoclopramide was injected into each BL-21 in BL-21 group. Metoclopramide was given totally at CV-12 in CV-12 group

Moxibustion Treatment

The commercial moxa(Whangtoseoamtum[®], Korea Sujichim, Korea) was applied for 5 minutes at each acupoint. Control group was intramuscularly administered only with 2% xylazine. Moxibustion treatment was maintained using 2 to 3 moxa for 5 minutes in experimental groups. Fifteen minutes after moxibustion treatment, xylazine was administered.

Induction of vomiting

Vomiting was induced by intramuscular injection with 2% xylazine(Rompun[®], Bayer Korea, Korea, 2.2 mg/kg) 20 minutes after AP treatment, respectively.

Results

Vomiting rates and vomiting times in needle-AP treatment

In needle-AP treatment, vomiting rate was 66.7%(4/6) and vomiting time was 2 to 4 minutes in control group. In experimental groups, the vomiting rates were 33.3%(2/6), 50%(3/6) and 33.3%(2/6) in BL-21, CV-12 and BL-21+CV-12 groups, respectively. The vomiting times were 4 to 5 minutes, 1 to 5 minutes and 3 to 4 minutes in BL-21, CV-12 and BL-21+CV-12 groups, respectively(Table 1). The vomiting rates of experimental groups were lower than that of control group, and vomiting times of experimental group were similar to that of control group.

Table 1. The antiemetic effect of needling acupuncture at BL-21 and CV-12

Group	Control	Acupoint		
		BL-21	CV-12	BL-21+CV-12
Vomiting rate (%)	4/6* (66.7)	2/6 (33.3)	3/6 (50)	2/6 (33.3)
Vomiting time (min)	2-4	4-5	1-5	3-4

*Vomiting dogs / examined dogs

The vomiting rates and vomiting times in injection-AP treatment

In injection-AP treatment, vomiting rate was 36.4% (4/11) and vomiting time was 2 to 4 minutes in control group. In experimental groups, the vomiting rates were 0% (0/6) and 16.4% (1/6) in BL-21 and CV-12 groups, respectively. The vomiting times were 5 minutes in CV-12 groups (Table 2). The vomiting rates of experimental groups were lower than that of control group and vomiting time of CV-12 group was similar to that of control group. The vomiting rates of experimental groups were lower than that of control group, and vomiting time of experimental group was similar to that of control.

The vomiting rates and vomiting times in moxibustion treatment

In moxibustion treatment, vomiting rate was 66.7% (4/6) and vomiting time was 2 to 4 minutes in control group. In experimental groups, the vomiting rates were 33.3% (2/6) and 33.3%(2/6) in BL-21 and CV-12 groups, respectively. The vomiting times were 2 to 4 minutes and 2 to 3 minutes in BL-21 and CV-12 groups, respectively (Table 3). The vomiting rates of experimental groups were lower than that of control group, and vomiting times of experimental group were

Table 2. The anti-emetic effects of aquapuncture with metoclopramide at BL-21 and CV-12

Group	Control	Acupoint	
		BL-21	CV-12
Vomiting rate (%)	4/11* (36.4)	0/6 (0)	1/6 (16.4)
Vomiting time (min)	2-4	0	5

*Vomiting dogs / examined dogs

Table 3. Antiemetic effect of moxibustion at BL-21 and CV-12

Group	Control	Acupoint	
		BL-21	CV-12
Vomiting rate (%)	4/6* (66.7)	2/6 (33.3)	2/6(33.3)
Vomiting time (min)	2~4	4~5	2~3

*Vomiting dogs / examined dogs

similar to that of control group.

Discussion

It was known that needle-AP^{1,19,20}, injection-AP¹², laser-AP⁶ and EA⁹ have therapeutic effects in various human and animal diseases.

As for the therapeutic effect by needle-AP, Hur *et al.*⁷ reported increase of feline gastric motility by ST-36 stimulation and Lee *et al.*¹⁰ also described increase of small intestine movement by ST-36 stimulation.

Stimulation at BL-21 showed more effective anti-emesis than that of CV-12 by needle-AP treatment in the present study. This result was similar to that BL-21 stimulation was more effective than that of PC-6 in canine xylazine-induced vomiting by Kim¹³. In addition, Choi *et al.*² reported that EA at BL-21 accelerated the gastric emptying time than those of CV-12, PC-6 and ST-36 by radiological and ultrasonographical examinations. It was thought that the anti-emetic effects at BL-21 and CV-12 might be caused by acceleration of gastric emptying time in the present study. Further research should be performed in the future.

Metoclopramide is a anti-emetic drugs to suppress central and peripheral vomitings. In the present study, metoclopramide injection-AP at BL-21 showed higher anti-emetic effect than those of control and CV-12 groups. This result was similar to that BL-21 stimulation was more effective than that of PC-6 in canine xylazine - induced vomiting by Kim¹³.

On the other hand, the therapeutic effect by moxibustion was approved in various human digestive system and genital diseases^{1,4,5,16} and treatment effect in disturbances of digestive system and reproductive system in animals⁹. Moxibustion at BL-21 showed higher anti-emetic effect than those of control and CV-12 groups. This result was similar that moxibustion was effective on digestive system. The anti-emetic effect by moxibustion was firstly clarified in small animal practice to our knowledge.

As for the acupoints, BL-21 is a Shu-point of the stomach meridian and CV-12 is a alarm point of the stomach meridian. In addition, those acupoints are used for the diagnosis and treatment of disease in the stomach meridian¹⁷. The stimulation at Shu-point (BL-21) showed higher anti-emetic rate than that of alarm point (CV-12) in the present study. That mechanism could not be clarified in the present study, however, the relationship between shu-point and alarm point should be investigated in various diseases of animals in near future.

In conclusion, needle-AP, injection-AP and moxibustion at BL-21 and CV-12 were more effective anti-emesis than that of control, and injection-AP at BL-21 showed the highest anti-emetic effect in the present study.

Reference

1. Chen HL, Huang XM. Treatment of chemotherapy-induced leukocytopenia with acupuncture and moxibustion. *Zhong Xi*

- Yi Jie He Za Zhi. 1991; 11: 350-352.
2. Choi MC, Chang JH, Lee KC, Nom TC, Yang IS, Yoon YS, Yoon JH. Radiographic and ultrasonographic evaluation of gastric emptying time of dogs after acupunctural stimulation. *Kor J Vet Clin.* 2003; 20: 49-51.
 3. Ettinger F. Textbook of veterinary internal medicine. 5th ed. Philadelphia: WB Saunders. 2000: 117-121.
 4. Guo W. Effects of head point needling on cardiac function and hemodynamics. *Zhen Ci Yan Jiu.* 1992; 17: 26-27.
 5. Gurfinkel E, Cedenho AP, Yamamura Y, Srougi M. Effects of acupuncture and moxa treatment in patients with semen abnormalities. *Asian J Androl.* 2003; 5: 345-348.
 6. Hong MS, Lee JY, Lee SE, Seo JM, Song KH, Kim DH, Cho KW, Kim MC, Lee BD. The effect of laserpuncture and aquapuncture with methionine on the recovery in artificially induced hepatic damaged rats. *Kor J Vet Clin.* 2002; 19: 125-131.
 7. Hur CW, Kim KS, Ahn CB, Yim ZG. Effect of Chok-Samni(S36) acupuncture on the gastric motility. *J Kor Acupunt Moxibustion Soci.* 1990; 7: 203-213.
 8. Hwang SH, Seo JM, Hong MS, Choi YS, Song KH, Kim DH, Kim MC, Shin KS. Immunomodulatory effect of acupuncture with canine parvovirus vaccine. 2001; 18: 369-373.
 9. Jang KH, Lee JM, Nam TC. Electroacupuncture and moxibustion for correction of abomasal displacement in dairy cattle. *J Vet Sci.* 2003; 4: 93-95.
 10. Lee BS, Youn HM, Jang KJ, Song CH, Ahn CB. The effect of zusanli (ST36) acupuncture on small intestinal motility. *J Kor Acupunt Moxibustion Soci.* 2000; 17: 221-230.
 11. Liu N. Influence of stimulating zusanli with moxibustion of different quality and quantity on gastrointestinal motor function of reserpinized rats. *Zhen Ci Yan Jiu.* 1995; 20: 48-53.
 12. Kim DH, Shen HQ, Zhang HY, Lee KY, Cho SW, Lee SH, Lee SO, Kwon GO, Kim IB. The effect of acupuncture anesthesia by acupoint in injection with Ketamine Hydrochloride in dogs. *Kor J Vet Clin.* 1998; 15: 399-403.
 13. Kim DS. The anti-emetic effect of acupuncture and aquapuncture at PC-6 and BL-21 on the emesis by Xylazine in dogs. Graduate school of Chungnam National University, M.S. Thesis. Korea, 2004.
 14. Morgan RV. Handbook of small animal practice. 3rd ed. Philadelphia: WB Saunders. 1997: 353-370.
 15. Okazaki M, Sakamoto H, Suzuki M, Oguchi K. Effects of single and multiple moxibustions on activity of platelet function, blood coagulation and fibrinolysis in mice. *Am J Chin Med.* 1990; 18: 77-85.
 16. Shen GX, Su N, Zhu HF. Immunomodulation of musk-moxa-string therapy in patients with scrofula. *J Tongji Med Univ.* 1990; 10: 164-168.
 17. Shoen AM. Veterinary acupuncture. Am Vet Publi. New York. 1994: 231-235.
 18. Song KH, Kim DH, Choi KJ. The effect of aquapuncture of total saponin on the damaged liver induced by carbon tetrachloride in rats. *Korean J Vet Clin.* 1996; 13: 108-113.
 19. Zhang J, Xu W. Frequent ventricular extrasystole treated by needling neiguan(PC-6) plus oral administration of mexiletine - a report of 30 cases. *J Tradit Chin Med.* 2004; 24: 40-41.
 20. Zhang S, Tang Z, Wu Z. Research of clinic and laboratory offace acupuncture effect and the exploration of their afferent pathways. *Zhen Ci Yan Jiu.* 1996; 21: 39-44.

胃兪穴(BL-21) 및 中腕穴(CV-12)에 대한 刺鍼, 水鍼 및 뜸 처치가 Xylazine을 투여한 개에서의 嘔吐 抑制效果

김유수 · 김건우 · 김지용 · 유건주 · 이상은 · 송근호 · 김명철 · 김덕환¹

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요약: 본 연구는 개에서 위수혈(BL-21) 및 중완혈(CV-12)에 대한 자침의 구토억제효과를 규명할 목적으로 수행하였다. 사용 혈위는 BL-21 및 CV-12이었다. 각 군에서 구토 유발을 위하여 2% xylazine(2.2 mg/kg)을 투여하였으며, metoclopramide 수침은 1 mg/kg의 비율로 해당 혈위에 각각 수침하였다 대조군 및 실험군에 있어서 xylazine 투여 20분전에 BL-21 및 CV-12에 자침, metoclopramide 수침 및 뜸 처치를 각각 실시하였다. 대조군 및 실험군에서 구토율 및 구토발현시간을 각각 조사한 결과는 다음과 같았다. BL-21자침군, CV-12 자침군 및 BL-21과 CV-12 병용 자침군의 구토율은 각각 33.3%, 50.0% 및 33.3%로서 대조군(66.7%)보다 낮았다. BL-21 자침군, CV-12 자침군 및 BL-21과 CV-12 병용 자침군에 있어서 구토 발현 시간은 대조군과 유사하였다. BL-21 수침군 및 CV-12 수침군의 구토 억제율은 각각 100% 및 83.6%로서 수침군의 대조군(63.6%)보다 높았다. 구토발현시간은 수침군의 BL-21 수침군은 0분 이었으며, CV-12 수침군은 5분으로서 수침군의 대조군과 유사하였다. BL-21 뜸 처치군 및 CV-12 뜸 처치군의 구토율은 각각 33.3%로서 뜸 처치군의 대조군(66.7%)보다 낮았다. 구토발현시간은 뜸 처치군의 대조군 2~4분, BL-21 뜸 처치군이 2~4분 및 CV-12 뜸 처치군이 2~3분으로서 큰 차이를 나타내지 않았다. 이상의 결과를 종합해 볼 때, 개에서 2% xylazine 투여로 유발된 구토에 대한 BL-21 및 CV-12의 자침, metoclopramide 수침 및 뜸 처치가 각각 구토억제에 효과적이었으며, 또한 이들 중 BL-21에 대한 metoclopramide 수침의 구토억제 효과가 가장 우수하였다.

주요어: 刺鍼, 水鍼, 뜸, BL-21, CV-12, 개