

# **Disease processes benefited by veterinary acupuncture: Experimental research**

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## **Introduction**

It is somewhat common for skeptics of veterinary acupuncture to claim that there is no scientific evidence for the efficacy of veterinary acupuncture. Such skeptics would be wise to do a PubMed search (<http://www.ncbi.nlm.nih.gov/pubmed>) of SCI (scientific citation index) journals before repeating blatantly ignorant statements. As the great American humorist Mark Twain once said "It is better to remain quiet and be thought a fool than to open one's mouth and remove all doubt".

The author has chosen a few acupuncture research papers from a recent PubMed search that will help the reader see some broad and perhaps underestimated benefits of veterinary acupuncture. After briefly reviewing the abstracts from these papers, possible clinical applications have been suggested.

## **Research example 1**

Evaluation of electroacupuncture treatment for thoracolumbar intervertebral disk disease in dogs  
*Journal of the American Veterinary Medical Association*

### **Objective**

To evaluate use of electroacupuncture combined with standard Western medical treatment versus Western medical treatment alone for treatment of thoracolumbar intervertebral disk disease in dogs.

### **Design**

Prospective controlled study.

### **Animals**

50 dogs with signs of thoracolumbar intervertebral disk disease.

### **Procedures**

Dogs were randomly allocated to one of two treatment groups and classified as having grade 1 to 5 neurologic dysfunction. Dogs in Group 1 received electroacupuncture stimulation combined with standard Western medical treatment; those in Group 2 received only standard Western medical treatment. A numeric score for neurologic function was evaluated at four time points to evaluate effects of treatments.

## Results

Time (mean  $\pm$  SD) to recover ambulation in dogs with grade 3 and 4 dysfunction in Group 1 ( $10.10 \pm 6.49$  days) was significantly lower than in Group 2 ( $20.83 \pm 11.99$  days). Success (able to walk without assistance) rate for dogs with grade 3 and 4 dysfunction in Group 1 (10/10 dogs) was significantly higher than that of similarly affected dogs in Group 2 (6/9 dogs). Dogs without deep pain perception (grade 5 dysfunction) had a success (recovery of pain sensation) rate of 3 of 6 and 1 of 8 in Groups 1 and 2, respectively, but the difference was not significant.

Overall success rate (all dysfunction grades) for Group 1 (23/26; 88.5%) was significantly higher than for Group 2 (14/24; 58.3%).

## Conclusions and clinical relevance

Electroacupuncture combined with standard Western medical treatment was effective and resulted in shorter time to recover ambulation and deep pain perception than did use of Western treatment alone in dogs with signs of thoracolumbar intervertebral disk disease.

## Clinical application

This is a good prospective clinical study with adequate numbers of patients which clearly indicates that for thoracolumbar IVDD, electroacupuncture combined with steroids yielded significantly better outcomes than steroids alone. The average practitioner of veterinary acupuncture may feel confident that, even concurrent with standard western biomedical treatments, electroacupuncture will still have a positive benefit.

## Research example 2

Clinical effect of additional electroacupuncture on thoracolumbar intervertebral disc herniation in 80 paraplegic dogs. *American Journal of Chinese Medicine* 38(6): 1015-25, 2010

The clinical efficacy of electroacupuncture and acupuncture in combination with medication for the treatment of thoracolumbar intervertebral disc herniation was investigated in paraplegic dogs with intact deep pain perception. To evaluate the additional effect of electroacupuncture, dogs treated with conventional medicines alone were compared to dogs treated with electroacupuncture and acupuncture and conventional medicine. Medical records of 80 dogs were reviewed for this investigation and classified into two groups undergoing different treatment methods: (1) treatment with conventional medicine alone (Group C,  $n = 37$ ) and (2) treatment with conventional medicine combined with electroacupuncture and acupuncture (Group CE,  $n = 43$ ). Prednisone was the conventional medicine and electroacupuncture was applied at GV07 and GV02-1 at 0.5-2.5mV, mixed Hz of 2 and 15Hz for 25-30 min. Acupuncture was performed locally at urinary bladder meridian points near the lesion, and bilaterally distantly at GB30, GB34, and ST36. Treatment efficacy was evaluated by post-operative neurologic function, ambulation, relapse, complication, and urinary function. Ambulation recovery was more prevalent in Group CE than Group C ( $p = 0.01$ ) and recovery of ambulation and back pain relief time was shorter in Group CE compared to Group C ( $p = 0.011$  and  $0.001$ , respectively). Relapse rate was significantly lower in Group CE ( $p = 0.031$ ). The results suggest that a combination of electroacupuncture and acupuncture with conventional medicine is more effective than conventional medicine alone in recovering ambulation, relieving back pain, and decreasing relapse. Electroacupuncture and acupuncture is thus a reasonable option for the treatment of intervertebral disc herniation in paraplegic dogs with intact deep pain perception.

## Clinical application

As with the first study, this retrospective evaluation of either conventional medical treatment alone or conventional medicine and acupuncture/electroacupuncture showed significant differences between the two treatment groups. With benefits such as more ambulation recovery, back pain relief, and lower relapse rates in T-L IVDD than conventional medicine alone, it seems that every informed veterinary practitioner would want to have this option available for their patients.

## Research example 3

Treatment of tracheal collapse in two dogs by injection acupuncture. *The Veterinary Record*, October 28, 2006

A 13-year-old Yorkshire terrier bitch weighing 3kg was referred with a primary complaint of severe cough, which had been present for three months. Local veterinarians had treated the dog with drugs including aminophylline for three months, without clinical improvement. On admission, the dog had a frequent and severe cough. Tracheal collapse and pulmonary oedema were observed on radiological examination. The dog was given the diuretic furosemide (Lasix tab; Handok Pharmacological) at a dose of 2mg/kg, orally, for one week; the clinical signs did not improve. Injection acupuncture with 2mg/ml butorphanol (Butorphan; Myungmun Pharmacological) was carried out, twice a week, for seven sessions. The total volume of butorphanol used at each session was 0.3ml (0.6mg), diluted with physiological saline to 1ml. Injection acupuncture of 0.1 to 0.2ml of the dilution was made at each acupoint. The acupoints used included three master points: BL13-Feishu, the back-reflex point for lung and respiration; LU01-Zhongfu, the front-alarm point for lung and respiration; and CV22-Tiantu, used classically for tracheal and upper bronchial diseases. At Session 2, the cough was much less apparent. The client expressed contentment with the improvement of clinical signs. Coughing was markedly reduced at Sessions 3 to 5, and by Session 7 there was only a slight cough. Radiological examination revealed that the tracheal diameter had increased. No further treatments with injection acupuncture were carried out. Follow-up one month later revealed marked improvement in the shape of the trachea; it was much wider and more normal than on first examination.

## Clinical application

Tracheal collapse is commonly difficult to manage in small breed dogs. This clinical study suggests that a form of acupuncture termed "aquapuncture" may be used to quickly reduce clinical signs of tracheal collapse. Further, radiographic evidence supports the hypothesis that true anatomical soft-tissue and tracheal tissue changes occur.

## Research example 4

Effects of electrostimulated acupuncture on ground reaction forces and pain scores in dogs with chronic elbow joint arthritis. *Journal of American Veterinary Medical Association*, May 1, 2006

### Objective

To determine whether use of electrostimulated acupuncture (ESA) would result in significant

improvements in ground reaction forces and lameness scores in dogs with chronic elbow joint osteoarthritis secondary to elbow joint dysplasia.

### **Design**

Randomized, controlled, crossover clinical trial.

### **Animals**

9 dogs with chronic forelimb lameness and radiographic evidence of elbow joint osteoarthritis.

### **Procedures**

All dogs had a three week control acclimation period during which gait analysis was performed weekly. Dogs then received ESA once weekly for three weeks followed by a sham treatment once weekly for three weeks or received the sham treatment followed by ESA. Gait analysis was repeated prior to each treatment, and owners were asked to provide pain scores by use of a visual analog scale method. Effects of electrostimulated acupuncture on ground reaction forces and pain scores in dogs with chronic elbow joint arthritis.

### **Results**

Treatment (control, acupuncture, or sham) did not have a significant effect on ground reaction forces for any limb. Owners of 8 of the 9 dogs were able to correctly guess the time period when ESA was delivered.

### **Conclusions and clinical relevance**

Results suggested that ESA did not have any significant effects on severity of lameness, as determined by measurement of ground reaction forces, or severity of pain, as determined by visual analog scale pain scores, in dogs with chronic elbow joint osteoarthritis secondary to elbow joint dysplasia.

### **Clinical application**

Is this Acupuncture Failure? Owners of 8 of the 9 dogs were able to correctly guess the time period when ESA was delivered. This experiment showed no significant change in severe chronic degenerative osteoarthritis in Ground reaction forces or Visual analog scale. But the owners reported that their companion animals felt better, had better quality of life. Perhaps sometimes, in advanced osteoarthritic disease, positive changes in quality of life may be more common than objective measures such as ground reaction forces.

### **Research example 5**

Influence of acupuncture on cortical senility-related gene expression spectrum in swift aging mice. *Shanghai Journal of Acupuncture and Moxibustion* 25 (01), 39-42, 2006

## Objective

To investigate the influence of acupuncture method of “Replenishing Qi to regulate blood and reinforcing the essence to strengthen the body” on cortical gene expression by a gene chip technique in swift aging mice (SAMP10).

## Methods

Male eight-month-old swift aging mice (SAMP10) and isogenous normal aging mice (SAMR1) were selected to observe changes with swift aging in SAMP10 cortical gene expression spectrum by a cDNA microarray technique and to investigate the influence of acupuncture on them.

## Results

The chip results showed that with swift aging, the expressions of 17 genes of nine kinds changed in P10 cortex, with 15 genes down-modulated and two genes up-modulated.

After acupuncture method of “Replenishing Qi to regulate blood and reinforcing the essence to strengthen the body” was used, all P10 swift aging-related gene expressions were reversed partly or totally, showing that acupuncture had its specificity.

Conclusion: Acupuncture method of “Replenishing Qi to regulate blood and reinforcing the essence to strengthen the body” can beneficially modulate the expression of cerebral aging-related gene and may thereby delay cerebral senility.

## Clinical application

Many veterinary acupuncturists have noted that their geriatric patients have positive behavioral changes that seem to exceed those due to pain relief alone. This research gives us the rather surprising information that, beyond the well-known endogenous opioid peptide release, acupuncture can actually change genetic expression in neural tissue. Veterinary acupuncturists may consider reversal of geriatric neural degradation and senility a maintenance goal.

## Research example 6

Effect of electroacupuncture on nerve growth factor in regeneration chamber after facial nerve injury. *Journal of Clinical Rehabilitation* 10 (07),186-188, 2006

### Background

It has been obtained by the animal experimental and clinical researches that electroacupuncture promotes the regeneration of peripheral nerve, but its mechanism is still unknown. Neurotrophic factor (NF) maintains the survival of neurons in injured nerve and promotes the axonal regeneration. The observation of the changes of nerve growth factor (NGF) before and after electroacupuncture stimulation probably provides, new approach on revealing peripheral nerve disorder.

### Objective

To observe the effects of electroacupuncture on NGF in regeneration microenvironment after

facial nerve injury. Design: Complete randomized-division and controlled animal experiment.

### **Materials**

50 New Zealand healthy adult rabbits were employed and randomized into two groups, named experiment group and the control, 25 rabbits in each one.

### **Methods**

(1) After intravenous anesthesia on experimental animal, the upper buccal branch of facial nerve was separated and exposed. Under surgical magnifying glass, the nerve was cut off and a silica-gel tube was used to be inlaid in two broken ends and fixed with stitching, by which, a regeneration chamber is formed. In experiment group, on the day when the rabbit was completely resuscitated from anesthesia in the operation, electroacupuncture was applied. Point: Yifeng (TE 17), Dicang (ST 4), Jiache (ST 6) and Hegu (LI 4). Method of treatment: perpendicular puncture was applied on Yifeng (TE 17), 1cm deep; penetrating puncture was from Dicang (ST 4) to Jiache (ST 6), 1.5cm deep; and on Hegu (LI 4), 0.5cm deep. The electrodes was attached on Yifeng (TE 17) and Dicang (ST 4) respectively, with dense-disperse wave, at 18-20 Hz, 1.5 V. The needles were retained for 30 minutes and the treatment was given once a day, totally for 14 days. In the control, no any management was applied.

(2) On the 3rd, 5th, 7th, 10th and 14th days after surgery, 10 animals were sacrificed, five rabbits in each of experiment group and the control. The fluid was collected from the regeneration chamber and double antibodies sandwiched enzyme-linked immunosorbent assay (ELISA) was used to determine NGF level in regeneration chamber. t test was adopted for the difference comparison of measurement data.

### **Main outcome measure**

Comparison of NGF level in regenerated chamber on the 3rd, 5th, 7th, 10th and 14th days after surgery.

### **Results**

50 rabbits were all in result analysis. From the 3rd day to 7th day after surgery, NGF level in regeneration chamber was not different remarkably between experiment group and the control ( $P > 0.05$ ). On the 10th and 14th days, NGF level in regeneration chamber in experiment group was higher remarkably than that in the control [On the 10th day after surgery: (2793.0  $\pm$  163.1), (2571.1  $\pm$  91.6) ng/L; on the 14th day after surgery: (2696.1  $\pm$  147.5), (2243.7  $\pm$  271.2) ng/L,  $t = 4.45, 3.44, P < 0.01$ ]. On the 7th day after surgery, NGF levels in regeneration chamber in both experiment group and the control were up to the peak. But, since the 14th day after surgery, NGF level in the control began declining, that in experiment group was still kept at a relatively high level.

### **Conclusion**

Electroacupuncture improves and maintains the stable high level of NGF in regeneration microenvironment after facial nerve injury, which is probably one of the mechanisms of electroacupuncture on promoting the regeneration of peripheral nerve.

## Clinical application

Traumatic, including iatrogenic, peripheral nerve injury is relatively common in veterinary patients. Veterinary acupuncture has a long empirical history of positive benefit in nervous system injuries. This research finally suggests a molecular mechanism by which peripheral nerve regeneration is enhanced. Most veterinarians would be happy to induce this benefit in their injured patients.

## Research example 7

Acupuncture prevents relapses of recurrent otitis in dogs: a 1-year follow-up of a randomised controlled trial. *Acupuncture in Medicine*, 2011

### Background

Recurrent infections within a particular, well-localised body location are often seen in veterinary and medical practice. This condition could represent a localised or segmental immune deficiency. Recurrent canine otitis seems to be one example of this problem. It has been reported that acupuncture increased the efficacy of conventional treatment for canine otitis by >50%.

### Objective

To assess whether the relapse rate of recurrent canine otitis over one year can be modified by acupuncture in adult dogs.

### Methods

One-year follow-up of a randomised controlled trial. 31 dogs with a history of recurring otitis were randomised into two groups. In addition to conventional treatment, each group received four sessions of either real acupuncture, Group A (n=16), or sham acupuncture, Group B (n=15). The main outcome for the follow-up was the rate of acute otitis episodes in each group over one year, with blinded evaluation. A  $\chi^2$  test was used for statistical analysis.

### Results

There was one dropout in each group. 14 (93%) dogs in Group A: were free of otitis relapses, compared with 7 (50%) in Group B ( $p<0.01$ ).

### Conclusion

Acupuncture seems effective for preventing relapses in cases of recurrent canine otitis. This result suggests that acupuncture could be tested as a treatment of other recurrent localised infections. Given the ability of acupuncture to modulate neurotransmitters and opioid peptides, which can in turn modulate the immune system, the immune response to acupuncture also seems worth exploring.

## Clinical application

Managing otitis externa can be challenging for any veterinarian and the companion animal's caretaker. A patient's sensitivity and reactivity may reduce owner compliance with ear cleaning.

This study reinforces the research which indicates that numerous immune cell changes occur locally at the point of physical needle insertion. Acupuncture can be a great tool for controlling or managing otitis externa.

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