

## Effect of Acupuncture on Intraocular Pressure in Normal Dogs

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**ABSTRACT.** The effect of acupuncture on intraocular pressure (IOP) was evaluated in normal dogs. After determination of baseline pressure, acupuncture was applied at 3 acupoints (LI-4, LIV-3 and GB-37) for 20 min. After acupuncture treatment, IOP were significantly lowered  $2.7 \pm 0.1$  in left eye,  $1.7 \pm 0.7$  in right eye, respectively ( $p < 0.05$ ). From these results of this study, an acupuncture therapy may be valuable treatment for decreasing on IOP in dogs.

**KEY WORDS:** acupuncture, canine, intraocular pressure.

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Acupuncture has been used to treat a wide variety of diseases and clinical conditions [7]. Acupuncture in the field of ophthalmology was clinically applied to treat patients suffering from myopia, glaucoma, retinitis pigmentosa (degeneratio retinae pigmentosa), and optic nerve atrophy [2]. Uhrig *et al.* reported that acupuncture therapy was suitable for decreasing the intraocular pressure (IOP) of glaucoma or ocular hypertension in human patients [6]. In rabbit, Chu *et al.* studied the ocular hypotension induced by electroacupuncture [1]. However, the effect of acupuncture on IOP has not been investigated in dogs.

This study was performed to examine the effect of acupuncture on IOP in normal dogs.

Forty clinically normal eyes in 20 healthy German shepherds (4–7 years old) of either sex were used in this study. Their average body weight was 36 kg (32–40 kg). This study adhered to the strict guidelines of the “Guide for the Care and Use of Laboratory Animals” of Seoul National University (Seoul, South Korea). Dogs were divided into two groups regardless of their body weight, age, and sex. The one was control group (10 dogs) and the other was acupuncture group (10 dogs). All dogs were at rest for 1 hr before experimentation. For the acupuncture group, two stainless steel needles (32 gauge, 30 mm long, Haeng Lim Seo Won, Seoul, Korea) were inserted bilaterally at three acupoints (LI-4, LIV-3 and GB-37) which Uhring *et al.* reported [6]. After inserting the needles, they were kept for 20 min (Fig. 1).

IOP (mmHg) was measured 10 min before, immediately after and 1 hr after acupuncture therapy using Tono-Pen tonometer (MENTOR® TONO-PEN™XL, Mentor O & O, Inc.). Topical anesthetic (proparacaine HCL 0.5%) was applied to cornea before the IOP measurements to minimize discomfort [3]. The probe tip was used to repeatedly contact the central cornea. Average IOP was displayed along with the range of coefficient of variance (5, 10, 20, or > 20%).

We accepted as valid only reading with  $\leq 5\%$  variance and measured the both eye respectively. Changes in intraocular pressure in two groups were evaluated by paired *t* test. The levels of significance were chosen as  $p < 0.05$ .

The average of IOP was measured  $20.9 \pm 2.0$  mmHg (left eye),  $20.7 \pm 2.0$  mmHg (right eye) in control group, and  $20.5 \pm 2.7$  mmHg (left eye),  $20.1 \pm 3.4$  mmHg (right eye) in the acupuncture group 10 min before acupuncture treatment. One hr after acupuncture, IOP was  $21.0 \pm 2.1$  mmHg (left

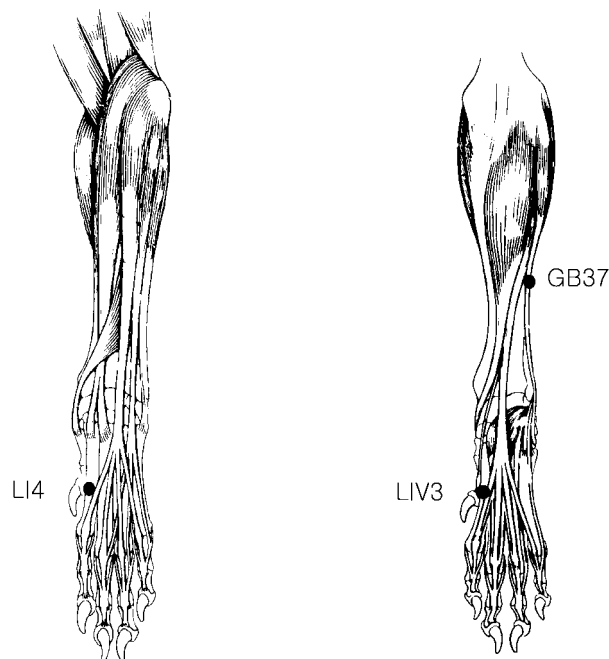


Fig. 1. Acupoint used for decreasing intraocular pressure in dogs. LI4: between the first and second metacarpal bones, at the level of the head the first metacarpus. LIV3: on the medial aspect of the second toe, proximal to the metatarsophalangeal joint. GB37: at the level of one-two the distance from the tip of the external malleolus and on the anterior border of fibular head.

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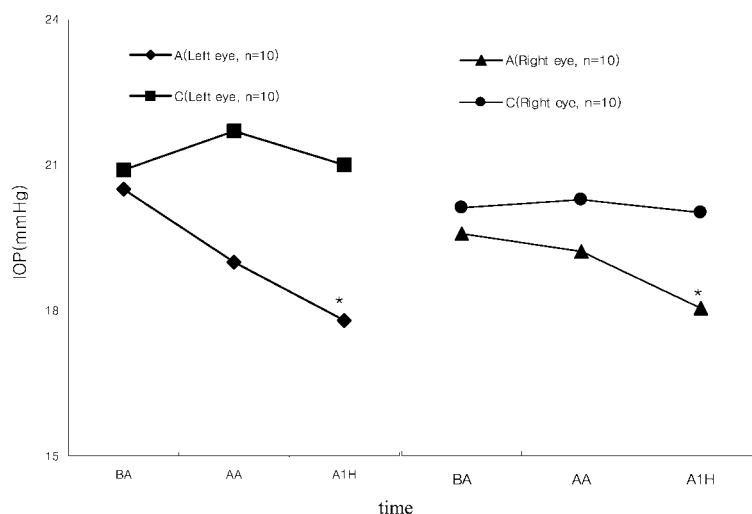


Fig. 2. The effect of acupuncture (A) and control (C) group on intraocular pressure (IOP) in normal dogs BA: 10 min before acupuncture. AA: immediately after acupuncture. A1H: 1 hr after acupuncture. \* Significantly different from the control. Paired *t* test ( $p < 0.05$ ).

eye),  $20.6 \pm 2.4$  mmHg (right eye) in control group and  $17.8 \pm 2.6$  mmHg (left eye),  $18.4 \pm 2.6$  mmHg (right eye) in the acupuncture group, respectively. IOP was significantly decreased  $-2.7 \pm 0.1$  (left eye), and  $-1.7 \pm 0.7$  mmHg (right eye) in acupuncture group ( $P < 0.05$ , Fig. 2).

In this study, we found that acupuncture treatment had beneficial effects on decreasing intraocular pressure. The intraocular pressure is generated through the aqueous dynamic process [5]. If the rate of aqueous humor formation equals the outflow, the IOP is maintained at a constant level [4]. However, if this system has any problems, the IOP is changed and glaucoma or ocular hypertension, which is abnormally elevated of intraocular pressure are occurred. Acupuncture therapy (acupuncture points LI4, LIV3, and GB37) was used to treat the glaucoma or ocular hypertension in 18 human patients [6]. There was associated with reduction of blood pressure, increase of the endorphine levels, and the suppression of the rate of aqueous humor by reducing the norepinephrine and dopamine level [1]. However, other factors may be contributed to decrease the intraocular pressure. If possible, more studies should be

required to investigate the effectiveness of acupuncture in the intraocular pressure.

From these results of this study, an acupuncture therapy may be a valuable treatment for decreasing on IOP in dogs.

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