J Acupunct Meridian Stud 2017;10(5):360–370

Available online at www.sciencedirect.com

Journal of Acupuncture and Meridian Studies

journal homepage: www.jams-kpi.com

RESEARCH ARTICLE

Comparison of Point Placement by Veterinary Professionals with Different Levels of Acupuncture Training in a Canine Cadaver Model

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Available online 12 August 2017

Received: Jul 11, 2017
Accepted: Aug 8, 2017

KEYWORDS
acupuncture;
dog;
needle placement;
TCVM;
training;
veterinary

Abstract
Veterinary acupuncture is becoming increasingly implemented for various disease processes, with growing numbers of veterinarians pursuing advanced training to meet the rising demand for this relatively new intervention. Accurate acupoint placement remains challenging, with individual practitioners relying on varying methods of point identification, often compounded by the transpositional nature of points for companion animals. The aim of this study was to assess for differences in acupuncture needle placement of select points between veterinary professionals with three different levels of acupuncture training in an academic teaching environment. Seven participants placed a total of six acupoints on a canine cadaver. Digital radiography was used to document each participant's point placement. Each participant's point location was then compared to a control "correct" point, and the distance between the two points was measured. A significant difference in placement accuracy was identified between the participants when grouped by training level ($p = 0.03$). These results indicate that veterinary patients receiving acupuncture treatment from veterinarians with different levels of training may subsequently experience varying effects, although further studies are warranted on more specific acupoint description as well as the clinical implications of needle placement accuracy.

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pISSN 2005-2901 eISSN 2093-8152
http://dx.doi.org/10.1016/j.jams.2017.08.002

1. Introduction

Acupuncture is increasingly administered in human and veterinary medicine as a primary or adjunctive integrative therapy for various clinical conditions [1—4]. The *Canon of Veterinary Medicine*, purportedly ascribed to Chinese authors in 620 B.C.E., is regarded as the first description of techniques representing possible early forms of acupuncture, but persistent controversies exist regarding the origins of the practice in Chinese medical history [5—7]. This and other historical Chinese texts largely address equine acupuncture. Acupuncture for companion animals is a more modern development, with significant contributions and growth in American and European veterinary communities in the past four decades [8]. Veterinary acupuncture across species has been evaluated in a number of clinical conditions and although older meta-analyses failed to support a definitive effect from the treatments, subsequent clinical trials investigated its role in pain control, neurologic disease, gastrointestinal disease, emergency resuscitation, behavior, dermatologic disease, and reproduction [9,10].

The American Veterinary Medical Association (AVMA) recognizes veterinary acupuncture as a subset of complementary and alternative veterinary medicine (CAVM), which are considered part of the practice of veterinary medicine [11]. Most American states require that veterinary acupuncture be practiced by a licensed veterinarian, but some laws possess different provisions regarding the scope of practice. No regulatory body oversees the training of veterinary acupuncturists. Courses are available from continuing education purveyors, including the Chi Institute, Colorado State University, and the International Veterinary Acupuncture Society. No studies have critically evaluated competencies or outcome measures as a function of training program or experience.

Veterinary exposure and training in the field of veterinary acupuncture remains variable. A survey of AVMA-accredited veterinary schools in 2000 documented a perceived lack of educational or research programs in CAVM within the veterinary profession [12]. A follow-up survey in 2011 identified an increase in CAVM coursework, much of it inclusive of acupuncture, from approximately 30% to 47% of programs, with a general consensus that further structured curricula was warranted [13]. Recent educational guidelines for CAVM, increasingly identified as integrative medicine when combined with other techniques, suggested that students, at minimum, receive an opportunity to develop baseline knowledge of the more commonly applied modalities of CAVM such as acupuncture in order to meet the increasing public demand for veterinary expertise in these topics [14]. Institutions that adopt this model also often have a high clinical caseload in the area; a 2015 retrospective study of 5195 integrative patient treatments at one veterinary academic teaching hospital demonstrated that acupuncture was incorporated into 81.5% of all treatment sessions [15].

Two systems of veterinary acupuncture point classification exist in veterinary medicine: classical points and transpositional points. Classical points are acupoints that were documented based on experiential effects or associations in China and were often unique to animals, with the most comprehensive set of points described in horses. These points retain their Chinese names and do not have a channel—number system, but are rather identified by anatomic location alone. Transpositional acupoints, those points transposed from human meridian and point anatomy to the structure of treated veterinary species, were developed in the 1970s when Western veterinarians and Chinese human acupuncturists developed an atlas of adapted acupoints [16]. Anatomic differences posed challenges for the transposition of some points. For example, the tail does not have an analogous structure on a human and an equine distal limb has a single digit. The placement of LI-4 in dogs remains complicated by the vestigial nature of the first digit as opposed to the opposable thumb in humans; consequently, this point may variably be placed on the medial surface of the second metacarpal bone or in the space between the second and third metacarpals. The dog also lacks a functional soleus muscle, with possible implications for placement and utility of SP-6. There are ongoing investigations into the neuroanatomic location of acupuncture points in veterinary species, and the "correct" locations and dimensions of acupoints, in both humans and animals, remains a subject of debate [16—18].

The relative placement of acupuncture points is guided by palpation and a proportional unit of measurement, known in Chinese as a "cun". This is defined as the width of the interphalangeal joint at a human patient's thumb, whereas it has been described as the width of a domestic animal's last rib [19]. The width and/or length of other body areas, such as the antebrachium or tibia, have been defined as a set number of cun; the length of the antebrachium, for example, is 12 cun from the elbow crease to the carpal crease (Fig. 1). Veterinary acupuncturists use these guidelines as well as direct palpation to locate specific acupoints.

A scientific model of acupuncture effects relies on accurate needle placement for appropriate stimulation of neural, fascial, vascular, and other structures that may be small to microscopic. Therefore, variability in needle placement could profoundly influence clinical effects. The interindividual variability of needle placement by veterinary acupuncture practitioners has not been assessed. The goal of this study was to evaluate differences in acupuncture needle placement in selected points between veterinary professionals with three different levels of acupuncture training in an academic teaching environment. It was hypothesized that more training would result in placement nearer the true acupuncture point, as defined by consensus between all participants while consulting point diagrams and established anatomic descriptions [19].

2. Materials and methods

2.1. Specimens

One adult medium-sized canine cadaver euthanized for reasons unrelated to this study was obtained from a local animal shelter. The dog was stored in a freezer at −20°C for 48 hours and then moved to a refrigerator at 2°C for 24 hours to allow for adequate thawing. After completion of