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Acupuncture Loci: A Proposal for Their Classification According to Their Relationship to Known Neural Structures

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Abstract: Much confusion and frustration has been caused by the inability of workers in acupuncture to demonstrate the exact nature of acupuncture loci or to identify them in neuroanatomic terms. This study reviews 70 selected, commonly-used acupuncture loci. Loci were determined by their traditional descriptions and checked with a neurometer and calibration-stable stimulator. It was found that acupuncture loci may be classified into at least three types: Type I correspond to a known anatomical entity—the motor point of a muscle; Type II to the focal meeting of superficial nerves in the sagittal plane; and Type III lie over superficial nerves or plexuses. As a first step toward acceptance of acupuncture by the medical profession, it is suggested that a new system of acupuncture locus nomenclature be introduced, relating them to known neural structures. Perhaps an international committee of interested workers should be struck.

PRACTITIONERS OF ACUPUNCTURE are well acquainted with the traditional concepts of meridian loci and meridian lines and the theory of Yin and Yang. Although these ancient theories are still being invoked, acupuncturists are today seeking more modern theories to explain the phenomenon.

Dr. P. D. Wall commenting on acupuncture for pain therapy in the 1974 International Symposium on Pain, divides acupuncture into two categories:

(a) The classical theory and its application based on the ancient concept which depends on the rebalancing of the Yin and Yang and insertion of needles into classical loci situated on meridians.

(b) The contemporary version which constitutes a gradual extension of the ancient theories—classical loci, for instance, are moving closer and closer to the dermatome of the injury and needles with or without electrical stimulation are being used.

Wall felt that the results presented at the International Symposium cannot be used to defend classical acupuncture but constitute a new phenomenon—one that is interesting and deserving of further explanation. Many workers in acupuncture also feel that a new system for the classification of acupuncture loci based on their relationship to known neural structures is overdue (1).

According to ancient Chinese concepts, acupuncture loci serve as "peeping holes" into the body and "passing holes" for energy. The total number of meridian loci is believed to be at least 365. Each locus has been named according to its effect, anatomical location, appearance and relation to meridian lines. Meridian loci are traditionally identified on the body by a complex measuring system based on the patient's own unique anatomical standard (2). More recently, a neurometer (see below) has been used for locus localization.

Method

Matsumoto (2), drawing from various sources, including recent Chinese texts, selected for description 70 commonly used and reportedly effective acupuncture loci. This study analyzes their locations on the body in relationship to known neural structures. Loci were determined according to Matsumoto's descriptions and other references (3,4). Many hours were also spent learning the traditional technique of locus location with Dr. H. Saita, D.O., former President of the Canadian Acupuncture Association (and the only practitioner of acupuncture recognized by the British Columbia College of Physicians and Surgeons).

Finally, neurometer readings were assessed at all loci examined (5). The neurometer (Model ND-S by Neuro-Medical Industry Works, Kyoto, Japan) is a simple instrument powered by dry cells and consisting of a microammeter with a probe and ground electrode. When the probe alights on a point on the skin where the resistance to direct current is low, it emits an audible signal and the microammeter shows a reading. When each point has been identified, its surface anatomy and neuroanatomy was evaluated according to standard texts (6,7).

Each of the authors took turns to be the subject of examination. All were in good physical health.

Results

Type I. Acupuncture Loci Related to Motor Points

An early observation in this study was that in the majority of the acupuncture loci investigated (47 of 70), the neurometer reading was high and precisely localized to a fine point; in others, the reading was lower and diffused (see Appendix for detailed analysis of 70 loci investigated). It was noted that many of these loci (thirty-five) having a concise reading were located at known sites of muscle motor points (8,9,13). These were classified as Type I. Other workers have also independently noted this (10,11,12).

A motor point is defined as the skin region where an innervated muscle is most accessible to percutaneous electrical excitation at the lowest intensity. Coers (8), who developed a biopsy technique which depended on first finding the motor point by electrical stimulation, showed that a motor point is near the skin and generally lies close to the neurovascular hilus of the muscle. Here, terminal branches of the nerve, which lie near the skin surface, are accessible for stimulation and correspond to the motor point. (Coers described a primary motor point with the presence of secondary points of lesser excitability in its vicinity.) When skin over a motor point is drawn aside, the cutaneous point which responds to minimum electrical stimulation is shifted but the muscle motor point

(where tenderness is sometimes felt) remains unaltered. The exact location of the motor point may vary slightly from person to person but it is a fixed anatomic site and is, of course, a known anatomic entity.

In this study, Type I loci were demonstrated to be muscle motor points by evoking muscle twitches in response to minimum electrical stimulation using a standard calibration-stable stimulator (TECA, Model CH-3 Variable Pulse Generator and Chronaxie Meter) with variable control of output.

Type II. Loci in the Midline of the Body

Eleven of 70 loci gave high and concise readings and were found in the sagittal plane. They do not correspond to motor points, but lie over focal areas where superficial nerves from both sides of the body meet (6).

As the neurometer probe is traced along the sagittal line, Type II loci appear at irregular intervals. Between these Type II loci occur other loci of lesser excitability. These latter probably represent the merging of segmental cutaneous nerves from the two sides of the body. It is postulated that at Type II loci readings are higher because two or more superficial nerves from the two sides of the body meet (6). For example, the skin over locus *pai hue* or GV20 (Go-20) on the vertex of the skull, midway between the inion and nasion, is supplied by bilateral branches from the trigeminal nerve (supraorbital, supratrochlear and auriculotemporal) and C2, 3 (lesser occipital). Another example is at the suprapubic locus *chu-ku* or CV2 (Co-2) where the bilateral anterior primary rami of L1 and S2 meet.

Type III. Acupuncture Loci with Diffused Neurometer Readings

Type III acupuncture loci with a neurometer reading over a diffused, non-circumscribed area, generally lie over conventionally described locations of nerve plexuses or superficial cutaneous nerves. For example, the locus known as *hsia-kuan* and corresponding to Mann's locus S7 (St-7) lies over the infratrochlear nerve.

Discussion

This study notes that acupuncture loci can be broadly divided into at least three groups; Type I are demonstrated to be motor points. These known anatomical entities have been in use by physiotherapists for many years as points for stimulating innervated muscle.

In a recent study (13), using surface electrodes for stimulation and treatment of low back pain, it was not found critical to place the electrode exactly over an acupuncture locus. This finding has also been recently reported on (14). However, at a motor point, relief of pain (and muscle contraction) could be obtained with minimal electrical stimulation. The further the electrode was moved away from the motor point, the greater the intensity of electrical stimulation required. Moreover, it is probable that when stimulation is induced mechanically with needle insertion without electrical stimulation (when the injury current created is minimal), the placement of the needle may have to be more precise—ideally at the motor point.

All three types of acupuncture loci appear to have a common factor—a rich supply of superficial nerves. When the neurometer probe comes in contact with these loci (and if

the direct current voltage is sufficient), a sharp pinprick sensation is felt—particularly intense at Types I and II loci.

The accuracy of a neurometer has been criticized, as skin resistance to direct current can vary according to room humidity, skin temperature, anatomic activity (sudomotor activity), voltage and other factors. Yet, in any one individual, under any given set of conditions, there is a definite relative difference in skin resistance over a motor point (and its secondary points) as compared to surrounding skin.

When using the neurometer, probe pressure and applied voltage should be at the minimum required to give a reading—generally 6-12 volts. High voltage causes discomfort and in combination with probe pressure may produce the "triple response" of Lewis: (i) a localized red spot or line at the site of contact, coming on in about a minute; (ii) a brighter red flush or "flare" of irregular outline and extending for a centimeter or so beyond the original red line, developing somewhat more slowly; and (iii) on rare occasions in sensitive skin, dermatographia or wheal formation at the site of the original red line. At stages (ii) and (iii) neurometer readings are higher, the receptive field larger with the appearance of secondary points of lesser excitability.

Because of the above shortcomings of the neurometer, it must be considered only as a simple aid for point localization and cannot be accepted as a definitive scientific instrument. In this study, a motor point is determined by using a standard calibration-stable stimulator with variable control of output.

In two other related studies, (a) an investigation into patients with upper limb pain (15), and (b) lower limb muscle tenderness in relation to low back pain (16), it was found that motor points were usually tender to pressure in the presence of neuropathy. Tenderness varied from mild to severe and could be latent or symptomatic. These hypersensitive and tender motor points or Type I acupuncture loci in many instances correspond with previous descriptions of "trigger points" and the myofascial syndrome (17,18).

It is suggested that, as a first step towards the understanding and acceptance of acupuncture by the medical profession, the present anachronic systems of acupuncture locus nomenclature be dispensed with in favour of a modern, scientific one using neuroanatomic descriptions. At the Workers' Compensation Board of British Columbia, acupuncture loci used for trancutaneous neural stimulation are classified according to the system described (13). Physiotherapists consequently have no difficulty in their identification.

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On the following pages is the Appendix, which lists in detail the 70 acupuncture loci investigated.