Acupuncture and Related Therapies 2 (2014) 29–33

Contents lists available at ScienceDirect

Acupuncture and Related Therapies

journal homepage: www.elsevier.com/locate/arthe

Hand held electroacupuncture devices—Potential for teaching in functional muscular neuroanatomy and musculo-skeletal diagnosis

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ARTICLE INFO

Keywords:
Acupuncture
Electro-acupuncture
Hand-held electrical stimulators

ABSTRACT

Hand-held electroacupuncture devices have been traditionally used as a tool to locate "acupoints" trough detection of differences in skin conductivity. While teaching at the Post-Graduation Courses on Medical Acupuncture in Portugal, both at the Universidade Nova de Lisboa and at the Universidade do Minho, the hand-held acupuncture device has become a fundamental tool for location of acupoints and teaching functional muscular neuroanatomy. Unlike traditional use, the device is used after needle insertion. After correct identification of the insertion site and needling, the needles are stimulated with the hand held device, enabling the students to check if the needle is correctly inserted and also visualize the action of the needled muscle. The hand held device is also a good tool for musculo-skeletal diagnosis and treatment.

1. Introduction

When first training in acupuncture, I was introduced to the use of the Pointer Plus, a simple hand held electroacupuncture device, as a tool for treatment of musculo-skeletal pain syndromes, i.e. the deactivation of trigger points. After needling into the trigger points or taut band, the muscle would be stimulated by touching the needle with the metal probe of the device. This would elicit a muscle contraction at 10 Hz (Pointer Plus has a fixed 10 Hz stimulation mode), and that stimulation would be maintained for up to 2–3 min, at 10–20 s bursts. The Pointer Plus was also used as a teaching tool while learning "acupoint" location and anatomy. In my practice I have since used a similar hand-held device.

When teaching Western Style Acupuncture in the Post-Graduation Courses in Lisbon and Braga [1], the Pointer Excel has become a pivotal tool in our teaching method, especially in teaching functional musculoskeletal anatomy and also as a diagnostic tool during the practical workshops. We were made aware that this way of locating "acupoints" is not common, and we believe this simple device has an important role in teaching acupuncture and in musculo-skeletal medicine.

2. Hand held electroacupuncture devices – the Pointer Excel II

We have chosen the Pointer Excel II for both our clinical practice and teaching, for this device allows stimulation from 1 to 16 Hz, making it, in our opinion, more versatile than the Pointer Plus. Also, it has an ergonomical shape, tough not well suited for left hand use.

The Pointer Excel II is a battery operated electroacupuncture device, which allows for skin conductivity measurements (traditionally for detection of acupoints) and ear and body acupuncture, either by stimulating the skin surface and, as we have been trained to use it, to correctly locate muscle insertions and deactivation of myofascial trigger points trough the stimulation of inserted needles.

The device operates with a 9 V battery, and delivers a square biphasic wave, with a pulse width of 260 μs. It allows for stimulation from 0 to 45 mili-amperes (mAmp), with a frequency from 1 to 16 Hz (Fig. 1).

Fig. 1. The Pointer Excel II.

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http://dx.doi.org/10.1016/j.arthe.2014.02.003
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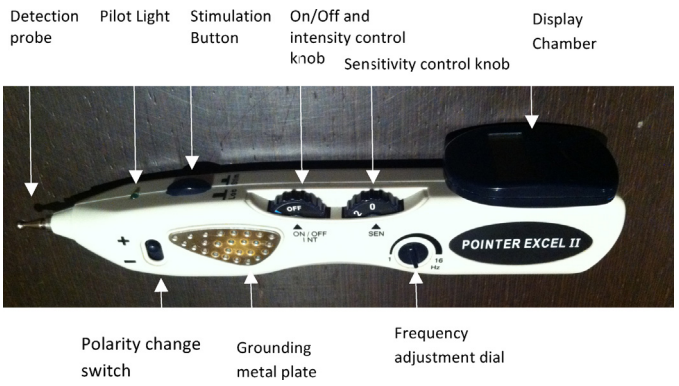

Fig. 2. Pointer Excel diagram.

Fig. 3. On/off and intensity control switch.

The Pointer Excel II has a quantity of buttons, knobs and displays (Fig. 2) [2], which at first glance may make it look difficult to operate. In practical terms, and for the applications we use it, it is not so.

In our practice, the polarity change-over switch is always kept on the "+" side.[1] The sensitivity control knob is always kept on 0, otherwise whenever touching the needle the device will beep and the green pilot light will blink, which is unpleasant.

When turning on the device, with the On/Off and intensity control knob, a "blue" and "black" zones are visible (Fig. 3).

The blue zone is numbered from 0 to 2, and is designed for stimulation in the micro-current range, from 0 to 2 mAmps, in a linear scale. The black part of the dial is numbered from 2 to 10, and the stimulation ranges from 2 to 45 mAmps, in a logarithmical scale.

The frequency adjustment dial regulates the frequency of stimulation, which can be set from 1 to 16 Hz (the limit may vary with individual devices, to about 20 Hz) (Fig. 4). When using the device for stimulation, by pressing the push type button in the top of the device, the selected frequency is then shown in the digital display chamber (Fig. 5). At the same time, the green pilot light indicator will flash at the chosen frequency.

In order for the device to function for stimulation, an electrical circuit has to be established, and that can be done in two different ways. One way is by using the metal surfaces the device has both on the lateral side and on the bottom. To stimulate, the practitioner touches the skin of the patient (if stimulating the skin is intended) or the needle handle or shaft with the detection/stimulation probe

[1] ("+" or "–" signs relate to classical TCM tonification and dispersion concepts).

Fig. 4. Frequency adjustment dial.

(when stimulating muscle inserted needles), and establishes a circuit by touching either one of the metal surfaces with one hand and touching the patient with the other (Fig. 6). The other way of establishing an electrical circuit is to hand-over to the patient a metal ground pole that is connected to the under surface of the device, which the patient will hold during the stimulation (Fig. 7). Whenever possible we prefer to use the first option, because holding the metal surfaces also constitutes another safety measure: when stimulating at high intensity, a tingling sensation on the finger touching the metal surface is felt by the practitioner, which usually means the intensity is too high.

3. Safety concerns

Some concerns have arisen that establishing the electrical circuit by touching the patient's skin may interfere with the functioning of a practitioner's pacemaker or implanted cardioversor-defribillator device (ICD) while stimulating, so in those cases, the grounding pole option is advised. In the later case, the metal surfaces of the device should not be touched by the practitioner (we suggest isolating both metal surfaces with insulating tape).

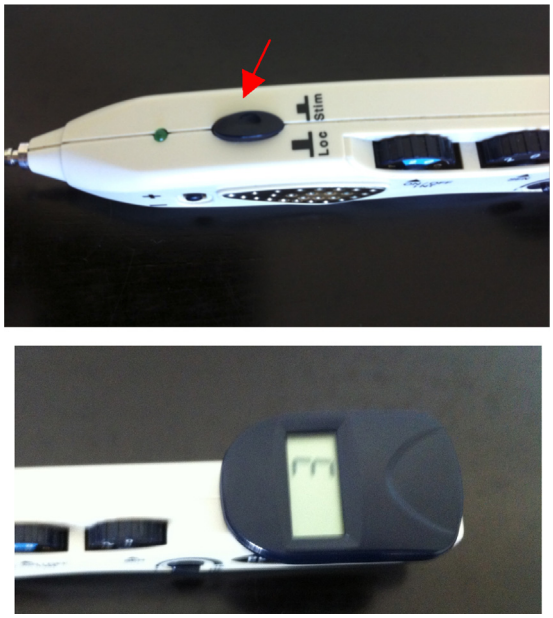

Fig. 5. When pushing the stimulation button, the set frequency will show in the display.