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CLINICAL CASE REPORT

The Effects of Acupuncture on Peripheral Facial Palsy Sequelae after 20 Years via Electromyography



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Abstract

Objective: This research used electromyography to evaluate the effects of acupuncture on facial palsy peripheral sequelae.

Methods: The 44-year-old woman who participated in this study presented sequelae resulting from 20 years of peripheral facial nerve palsy (FNP) on the right side and synkinesis in the left eye. In electromyography, the electrodes were positioned on the motor points over the orbicularis oris and the orbicularis oculi muscles to establish myofunctional feedback prior to and after rehabilitation, which consisted of 20-minute sessions of acupuncture once per week for 20 weeks: using manual stimulation at acupoints Yintang, LR3, GB21, CV17, ST2, ST3, ST6, ST7, GB2, and SI19; and Tou-Kuang-Min and ST4 using electrical stimulation with a 4-Hz pulsed current. The subjective pain intensities were recorded.

Results: The root-mean-square (RMS) electromyographic comparative analysis showed greater activation and recruitment of muscle fibers on the right side and a reduced overload on the left side, which promoted a functional evolution of movements and a positive response in the stomatognathic system.

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Conclusion: Acupuncture associated with electrical stimulation reversed the peripheral facial paralysis in a short time. Severe sequelae were minimized due to the balance of muscle activation in response to the electrical stimulation provided by the acupuncture needles.

1. Introduction

Bell's palsy is an acute, unilateral paralysis of the face that is also known as idiopathic facial paralysis. The onset of Bell's palsy is the result of a dysfunction in cranial nerve VII, which may be preceded by pain in the mastoid region and may result in either partial or complete paralysis of the facial mimics [1,2], which is a primary means of human communication for expression and identification of feelings and ideas. Because the mobility of the mouth muscles is essential for speaking, facial expression, and eating [2], precise control of the facial muscles produces subtle variations in the muscular physiology, these variations being essential to facial expressivity and to its functions when verbal communication alone is not enough [3,4].

The nervous influx interruption in any one of the segments of the facial nerve [1,2], according to traditional Chinese medicine, causes an obstruction in the movement of energy and blood in the Yang meridians of the face. Invasion of exogenous pathogenic wind and cold associated with internal pathogenic factors (emotions) attacks the body and is likely to damage Yang, reducing the ability of contraction by stagnation and malnutrition of the tissues of the facial muscles. This is when this condition and motor impairment occur [4]. Therefore, the disease is a result of an imbalance between yin and yang that may lead to the preponderance of one, determine the characteristics of the disease caused by a sum of internal and external agents, and affect the antipathologic factor (ZHENGQI) of the individuals, forcing them into a pathologic process that will take a course that is determined by the organic entity of each being [5] and manifest itself in the form of facial or eye paralysis, falls, confusion, loss of language, hemiplegia, and fainting [6].

The basic patterns of disharmony characterize the group of signs and symptoms that determine the patient's disease. In traditional Chinese medicine (TCM), these patterns can be analyzed through various points of view: for example, loss of balance of Yin and Yang, the relation to the five movements, and the internal systems [6]. When a disease is being treated, some appropriate measures should be taken into account in relation to the physical and emotional conditions and the age of the patient, considering that the main symptoms may vary at different times and in different environments. These factors may also affect the appearance and the evolution of a disease; therefore, each factor should be carefully considered for the appropriate application and utilization of therapeutic modalities. Climate and emotional changes may have an impact on the physiological functions and on the pathological changes of the body. Consequently, the syndrome, the profile, and the condition of a patient should be analyzed during treatment. Satisfactory therapeutic results can be achieved with a complete and deep analysis [7–9].

Based on these ideas, the main goal of this research was to analyze by means of electromyography the effects of acupuncture after 20 years of sequelae resulting from peripheral facial paralysis.

2. Materials and methods

A 44-year-old woman participated in this study. The patient presented sequelae resulting from 20 years of peripheral facial paralysis on the right side, with synkinesis in the left eye. This study was approved by the Research Ethics Committee of the Claretiano Centro Universitário (number 69/2011; São Paulo, Brazil). The participant was informed about the experiment and agreed to participate by providing her free and informed consent according to resolution 196/96 of the National Health Council of Brazil. The following pieces of equipment were used: an EMG model 810C system (EMG System; Brazil LTDA, Brazil) with disposable electrodes, a Nikon Coolpi S2600 Digital Camera 14.0 MP, systemic acupuncture needles (0.25 mm × 30 mm), facial needles (0.25 mm × 15 mm), tsing, and a TENS unit (Quark, model Diapulsi 990; Brazil).

Prior to treatment, the electrodes for electromyography were positioned on the skin over the orbicularis oris and the orbicularis oculi muscles. After 20 sessions, the procedure was repeated for a myofunctional evaluation to check the effectiveness of the treatment. Photography was used to provide a visual pattern of the morphological changes that occurred in the face to determine the existing asymmetries prior to and after the application of acupuncture.

Systematic acupuncture was applied as follows: manual stimulation was applied at the acupoints Yintang, LR3, GB21, CV17, ST2, ST3, ST6, ST7, GB2, and SI19 and Tou-Kuang-Min and ST4 with electrical stimulation with a 4-Hz pulsed current. The subjective pain intensities of the patient were recorded and are shown in Table 1. Both techniques were applied simultaneously for 20 sessions of 20 minutes each, with a 1 week interval between sessions.

Table 1 Parameters and characteristics of electrical stimulation on ST4 and Tou-Kuang-Min.

Parameters	Characteristics
Current	Pulsed
Stimulation amplitude	Motor
Phase duration	2 ms
Waveform	Bipolar
Stimulation frequency	4 Hz
On/off time	—
Type of contractions	Phasic
Stimulation time	20 min
Frequency of sessions	1/wk

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