Clinical Research

Influence of different acupoint combinations on immediate effect of surface electromyography of patients with cervical spondylosis*

不同腧穴配伍对颈型颈椎病患者体表肌电即时效应的影响*

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ARTICLE INFO

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* Supported by "The 12th five-year plan" programmed project of educational science in Hubei Province: 2014B095.

Accepted on May 31, 2016

ABSTRACT

Objective To observe the influence of different acupoint combinations on immediate effect of surface electromyography of patients with cervical spondylosis, and to explore the interactions and laws among different acupoint combinations. **Methods** Acupuncture in three kinds of different acupoint combinations was conducted on 90 patients with cervical spondylosis (three groups): group A [distal point selection group: Kūnlún (昆仑 BL 60) and Hòuxī (后溪 SI 3)]; group B [local point selection group: Fēngchí (风池 GB 20) and Tiānzhù (天柱 BL 10)]; group C (distal and local point selection group: BL 60, SI 3, GB 20 and BL 10). Self control before and after treatment was adopted to observe the mean value of surface electromyography (SEMG) amplitude, to measure the mean values of integrated electromyography (IEMG) and electromyography root mean square (RMS), and to calculate the variation rate of electromyography amplitude of trapezius on the affected side of patients before and after acupuncture. The differences of influences of different acupoint combinations on immediate effect of surface electromyography were compared intra-group, and the differences among the three groups after acupuncture were also compared. **Results** According to the intra-group comparison before and after acupuncture, the differences of mean value of electromyography amplitude, variation rate of electromyography amplitude, IEMG and RMS were both statistically significant (all $P<0.05$). According to the inter-group comparison after acupuncture, the mean value of electromyography amplitude, variation rate of electromyography amplitude, IEMG and RMS varied in different degrees, however, the differences were not significant (all $P>0.05$); there was no significant difference in the total effective rate among the three groups ($P>0.05$). **Conclusion** Acupuncture treatment in different acupoint combinations can increase IEMG and RMS and reduce mean value of electromyography amplitude and variation rate of electromyography amplitude, enhance cervical vertebral stability and active contractility of muscle fiber, and improve the fatigue resistance of neck flexion; while, the therapeutic effect of acupuncture on cervical spondylosis has nothing to do with the distance or the number of selected acupoint.

KEY WORDS: acupoint combination; cervical spondylosis; surface electromyography

Cervical spondylosis (CS) is a kind of symptom complex including pain in head, neck, shoulder, arm, and etc. and limb dysfunction due to the compression on cervical nerve root, blood vessel, spinal cord or sympathetic nerve caused by cervical vertebra and cervical soft tissue lesions[1]. Cervical spondylosis is classified into 6 types according to the involved tissues and different symptoms and manifestations: neck type cervical spondylosis, cervical spondylotic vertebral arteriopathy, cervical spondylotic radiculopathy, cervical spondylotic myelopathy, and etc[2]. Neck type cervical spondylosis, which is also called ligament articular capsule type cervical spondylosis[3], is the early type of cervical spondylosis, occupying 40% of the total types of cervical spondylosis[4]. Neck type cervical spondylosis attacks young people mostly, and the average age of patients is lower than before and the incidence is gradually rising with the development of science and technology and variation of people's life styles[5]. In this study, under the guidance of acupuncture-moxibustion theory in traditional Chinese medicine, the influences of different acupoint combinations on the immediate effect of surface electromyography of patients with neck type cervical spondylosis were studied, and the differences of acupuncture efficacy among different acupoint combinations were explored, providing basis for the guidance of clinical point selection during acupuncture treatment of cervical spondylosis and improvement in clinical efficacy.

CLINICAL DATA

General data

Ninety undergraduates and postgraduates with neck type cervical spondylosis from Hubei University of Chinese Medicine were selected from March to June, 2015. There were 45 males and 45 females with the age of 21–27 years old. All the subjects signed Informed Consent Form before study, and they participated in this study voluntarily. X-ray film or CT examination and manual muscle test by physician were conducted for all the subjects. Random number sequence was produced by using computer-generated random number table, and 90 random grouping cards were produced. The cards were sealed in opaque envelopes, and envelope number was identical to the serial number on the card. The envelopes were placed orderly according to the number, and 90 subjects were divided into three groups according to the order of treatment with 30 cases in each group. In distal point selection group (group A), there were 16 males and 14 females with the age of 22–25 years old, mean age of (23.42±1.26) years old and course of disease of (17.34±5.41) months; in local point selection group (group B), there were 15 males and 15 females with the age of 23–27 years old, mean age of (24.66±1.41) years old and course of disease of (16.61±4.75) months; in distal and local point selection group (group C), there were 14 males and 16 females with the age of 21–25 years old, mean age of (22.59±1.35) years old and course of disease of (16.53±5.29) months. There was no statistical difference in age, gender and course of disease according to the baseline information among the three groups (all $P>0.05$).

Diagnostic criteria

The diagnostic criteria of cervical spondylosis were formulated by reference to relevant criteria in *Criteria of Diagnosis and Therapeutic Effect of Diseases and Syndromes in Traditional Chinese Medicine*[6] (1994) and *Modern Study on Cervical Spondylosis*[7] chiefly edited by ZHAO Ding-lin. ① Clinical characteristics: with chief complaint of pain in neck, shoulders, occipitalia and back, cervical movement limitation, concomitant corresponding tenderness points and stiff neck, and cord lesion in neck during massage. ② Imaging change: cervical lordosis change was shown from X-ray film, and mild trapezoidal change was shown from cervical lateral dynamic X-ray film; degeneration of intervertebral disc or backward prolapse of intervertebral disc was shown according to MRI.

Inclusion criteria

The patients conforming to the following criteria were included in the study: ① conforming to diagnostic criteria of traditional Chinese medicine and western medicine; ② without definite location sign during nervous system examination; ③ straightening of cervical lordosis or mild osteoproliferation according to X-ray film; ④ without taking any drugs which might impact the efficacy of this study or other therapeutic medicines before the study; ⑤ willing to participate in this clinical observation and signed Informed Consent Form, and with good compliance.

Exclusion criteria

The patients conforming to one of the following criteria were excluded from the study: ① cervical vertebral fracture and dislocation; ② cervical vertebral osteoporosis and cervical vertebral tumor; ③ with such symptoms as dizziness, headache, paralysis of limbs, etc.

Experimental equipment and apparatus

① Experimental equipment: MP150 multi-lead physiological recording instrument provided