

CLINICAL OBSERVATION

Differences in thermal effects of moxibustion at Zusanli (ST 36) and Hegu (LI 4) on various facial areas in healthy people

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Abstract

OBJECTIVE: To study the effects of temperature on different facial areas by suspended moxibustion at two points, Zusanli (ST 36) and Hegu (LI 4), and probe the phenomena underlying self-regulation in the human body after thermal stimulation.

METHODS: Thirty healthy volunteers accepted moxibustion over Zusanli (ST 36) and Hegu (LI 4), and the order of moxibustion points was randomly determined. Moxibustion method: suspension of moxibustion over Zusanli (ST 36) and Hegu (LI 4) on both sides was performed using an ignited moxa stick stuck in a support for 20 min. Observation method: An infrared thermal image of the face was taken before and after suspended moxibustion using a CK350 medical infrared thermal imaging instrument. Data analysis: A thermal microscopic section view system (TMTSys) was used to analyze the change in temperature in special facial areas. Statis-

tical analysis was carried out using SPSS 14.0 software.

RESULTS: Before moxibustion was suspended, the facial thermal image showed a T-shaped thermal area related to the vascular distribution with even temperature and good symmetry on both sides. Suspended moxibustion over Zusanli (ST 36) have a very significant increase in temperature at the forehead, around the nose, at the corners of the mouth, and at the cheeks and lips ($P < 0.01$). Suspended moxibustion over Hegu (LI 4) also have a significant ($P < 0.05$) increase in temperature around the nose, the corners of the mouth, the cheeks, and lips, where has a new high temperature area was formed ($P < 0.01$). Suspended moxibustion over Hegu (LI 4) raised the temperature at the middle point of the lips more obviously than did Zusanli (ST 36) in the same person, ($P < 0.05$). After 10 min of moxibustion over Zusanli (ST 36) and Hegu (LI 4), the change in temperature in the facial area reached its peak value.

CONCLUSIONS: Facial infrared thermography of healthy people revealed a T-shaped thermal area reflecting a physiological thermal area. Moxibustion over Zusanli (ST 36) or Hegu (LI 4) raised the temperature in this facial T-shaped thermal area. Hegu (LI 4) led to the formation of a new thermal area in the lips. The time required for moxibustion to regulate human body temperature was 10 min.

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Key words: Moxibustion; Point ST 36 (Zusanli); Point LI 4 (Hegu); Infrared thermal image

INTRODUCTION

The specificity of acupoints is one of the theoretical bases of acupuncture and moxibustion. In general, facial and oral diseases are treated with acupuncture at Hegu (LI 4), but rarely at Zusanli (ST 36), while Zusanli (ST 36) and Hegu (LI 4) are scarcely used to treat diseases of the eye and ear. Does the difference in indications between the two points originate from a difference in the area of effect? Is there any modern scientific evidence for a difference in the area of effect besides the explanation given by the traditional theory on channels and collaterals? In this study, by observing the changes in facial thermal images before and after suspended moxibustion over Zusanli (ST 36) and Hegu (LI 4), the difference in the effects of moxibustion at the 2 points on different facial areas was analyzed to probe the principles underlying the indications of the two points. The specificity of acupoints and the reactions of the human body to moxibustion were studied.

Subjects

The same subject underwent tests of two different paired designs. According to the inclusive and exclusive standards, 30 subjects aged 23-64 years (average 34.8 years), were selected from among healthy people in the check-up center of the PLA General Hospital from November 2010 to June 2011. Two paired subjects of the same sex, and similar age and body weight were randomly distributed to Hegu (LI 4) and Zusanli (ST 36) groups. After an interval of 48 hours, each subject underwent moxibustion at the other point. The subjects were told and agreed to the therapeutic plan, which was approved by the ethical and moral committee of the hospital.

Inclusion criteria

1) General check-up was normal. 2) Chest X-ray photograph, blood routine, blood biochemical examination, blood microbiological test, supersonic check of the liver, gallbladder, pancreas, spleen and kidney were all normal. 3) There was no obvious discomfort in the body within a week before study commencement. 4) There were no facial acupuncture, moxibustion, cupping, external application, massage or other treatments influencing local temperature within a week. 5) The subjects signed the informed consent document and voluntarily took part in the research.

Exclusion criteria

Subjects with diseases or dysfunctions influencing facial thermography such as common cold, rhinitis, conjunctivitis, insomnia and cerebral ischemia, as indicated by infrared thermography and supported by the subjects, were excluded from the trial regardless of the findings at check-up.

METHODS

Methods of moxibustion

Moxibustion and infrared detection were carried out in a screened room with temperature at 24-26°C, relative humidity at about 60%, no air convection, no direct sunshine and no abnormal radiant source. Subjects were seated and placed their forearms on the table; suspended moxibustion was then performed over Hegu (LI 4) on both sides with an ignited fumeless moxa stick (produced by Luying Moxa Biological Products Ltd in Nanyang, Henan Province) placed in the support. The subject was asked to regulate the distance to the stick by himself/herself until a local warm sensation was felt without scorching pain. Moxibustion was performed for 20 min in all subjects, during which ash was removed after 10 min of moxibustion. The manipulation method was the same for suspended moxibustion over Zusanli (ST 36) on both sides.

Method of detection

After the area of the subject to be detected had been exposed for 15 min in the screened room, infrared thermography of the facial front position was collected (one before moxibustion, one every two min during moxibustion and one after moxibustion) using a CK350 medical infrared thermal imaging instrument (produced by Fengte Electric Infrared Technology Ltd in Guangzhou with an image resolution of 384×288, temperature resolution of 0.08°C, spatial resolution ≤ 1.5 mrad and data collection 30 times per second).

Data analysis

A TMTSys analysis system provided by Aierci Medical Infrared Sci-tech Ltd in Beijing was used to measure temperature and analyze images. Temperature was respectively measured before and after moxibustion at the following places: 1) Yangbai (GB 14) (one finger above the middle of eyebrows), 2) Jingming (BL 1) (inner sides of the eyes), 3) Yingxing (LI 20) (both sides of the nose wing), 4) Dicang (ST 4) (corners of the mouth), 5) cheeks, and 6) center of the lips. Environmental temperature was measured as background temperature to calculate the calibrated temperature, which was equal to the measured temperature minus the background temperature. The difference in temperature was equal to the calibrated temperature after suspended moxibustion minus the calibrated temperature before suspended moxibustion. Data were reorganized into measurement data.

Changes in the temperature of various facial areas before and after moxibustion over Zusanli (ST 36) and Hegu (LI 4) were observed by infrared thermography. Areas and person-times with higher temperatures were recorded, and the data were reorganized into enumeration data. The χ^2 test was used to analyze the results, as shown in Table 1.

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