

Case Report

Is Acupressure Useful for Alleviating Hyperventilation Syndrome?

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Case Report

On April 23, 2017, a plane was flying from Hefei to Guangzhou in China. About 20 min after take-off, a 30-year-old female passenger suddenly had onset of face reddened all over, breathlessness, dyspnoea, palpitation and chest pain. Fortunately, two doctors came over to give help, one is Prof. Zhang, a cardiovascular specialist, the other one is Prof. Tan, a cardiovascular surgery specialist. After inquiring symptoms, two doctors believed that the woman had no organic abnormalities according to several medical examinations before, and once had a similar attack. Upon examination, the woman's respiratory rate was over 40 breaths per minute, and heart rate was over 120 beat per minute. Finally, the woman was diagnosed with hyperventilation syndrome (HVS) by the two doctors. However, there was lack of medicine in the flying plane. Doctors let her wear an oxygen face mask without oxygen, and try to stay calm by abdominal respiration, but it didn't work. At that moment, doctors tried to give acupressure treatment by alternately pressing the acupoints of Neiguan (PC 6) and Hegu (LI 4) on patient's two hands. Firstly, a doctor pressed both sides of LI 4 acupoints by fingers for about 10 min, and then changed to press the acupoints of PC 6 for about 10 min. The woman felt mildly pain for the pressure position indicating that the pressure was appropriate. In the process of acupressure treatment, the woman gradually felt better without breathlessness, dyspnea, chest pains and palpitation, and her respiratory rate was less than 20 breaths per minute, and heart rate less than 100 beat per minute.

Discussion

From this unexpected event, we can know that HVS can trigger by the anxiety of flying plane, where there are always lack of effective drugs and delay in seeking medical. However, the acupoints of PC 6 and LI 4 acupressure may be a convenient method for alleviating HVS.

HVS is characterized by a set of somatic and psychological symptoms that appear to be a consequence of episodes of hyperventilation with no underlying organic abnormality.⁽¹⁾ About 10% of patients were diagnosed with HVS in a general internal medicine practice and up to 6% of the general population exhibits aspects of HVS. Psychosomatic stressors, such as overwhelming anxiety, distressful events, military life, and other situations, that are thought to be the main cause of HVS.⁽²⁾ HVS patients appear to have clinical symptoms such as various anxiety, breathlessness, dyspnea, hypocapnia, tetany, palpitation, chest pain and unconsciousness, which results in excess minute ventilation and hypocarbia. Traditionally, it has been regarded that hyperventilation attacks is generally reversible and that the administration of anxiolytic agents or the paper-bag method leads to the disappearance of such attacks regardless of their severity.⁽³⁾ However, the paper-bag method has not been recommended for the treatment of patients with HVS because it might related to the incidence of death, severe hypoxia, or myocardial infarction.⁽⁴⁾ Present event speculated that PC 6 and LI 4 acupoints acupressure might be useful for alleviating HVS.

Acupuncture is an alternative therapy that involves the insertion of needles for treatment. Acupressure, unlike acupuncture, requires no needle insertion, and it works via delivery of finger pressure to the specific anatomical acupoints of the body. With similar therapeutic principles as acupuncture, acupressure is more appealing as a safe and non-

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invasive alternative.⁽⁵⁻⁷⁾ Besides, acupressure is a kind of finger pressure therapies, and the method is simple and easy to operate, and can consolidate the curative effect by repeated stimulation to the acupoints to sustainably produce the effect.⁽⁸⁾

PC 6 acupoint is located three finger breadths above the transverse crease of the wrist on the inner forearm, in between the two tendons (Figure 1A). In Chinese medicine, the PC 6 is located on the Pericardium Meridian and is theorized to be connected to Xin (Heart), so acupuncture at PC 6 acupoint could exert its effect on the heart.⁽⁹⁾ As well known, acupuncture at PC 6 can decrease heart rate, lower blood pressure, reduce oxygen consumption, allay excitement, increase coronary blood flow and improve hemorrheology.⁽¹⁰⁻¹²⁾ Besides, previous animal experiments demonstrated that electroacupuncture at PC 6 could regulate the median nerve, the spinal dorsal horn neurons of C3–T3, and the nucleus of the solitary tract in the brain stem, and could also adjust vasoactive substances, such as thromboxane B2, prostacyclin I2, endothelin, and calcitonin gene-related peptide.^(9,13,14) Bian, et al⁽¹⁵⁾ have demonstrated that the therapy of electroacupuncture at PC 6 can improve the myocardial ischemia by regulating the sodium channel and calcium overload. Another study reported that PC 6 acupressure could be effective in relieving nausea and vomiting because it stimulates blood circulation and then inhibits the activities of the cerebral cortex.⁽¹⁶⁾ Besides, a study have indicated that the acupuncture of the PC 6 have obvious effect in improvement of cerebral blood flow, which alleviate the symptom of dyspnea and palpitation.⁽¹⁷⁾

LI 4 acupoint is located on the dorsum of the hand, between the 1st and 2nd metacarpal bones, in the middle of the 2nd metacarpal bone on the radial side (Figure 1B), which is the Yuan-Primary acupoint of the Large Intestine Meridian of Hand Yangming, and the Large Intestine Meridian interlinks with the Stomach Meridian of Foot Yangming. Acupressure at LI 4 has been frequently used in clinical practice, mainly for treatment of facial palsy, dizziness, hemiplegia, fever and hidrosis, especially efficacy in treating a variety of pain.⁽¹⁸⁾ The statement of the National Institutes of Health indicated the treatment efficacy of acupuncture for situation such as pain and nausea.⁽¹⁹⁾ Several studies reported that the mechanism was that puncturing LI 4 could lead to the

activation and inhibition of the pain corresponding areas of brain function, regulation of interactions between nuclei and the neural pathway, and release of chemicals and hormones to the target organs through the changes of meridian substance, energy and information.^(8,20)

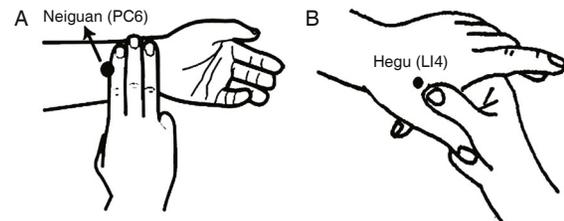


Figure 1. Location of Acupoints PC 6 (A) and LI 4 (B)

In the present unexpected event, the hyperventilation attacks recurred was triggered by the anxiety of flying, with sudden onset of face reddened all over, breathlessness, dyspnoea, palpitation and chest pain, and symptoms relieved by alternately acupressure at PC 6 and LI 4 acupoints. As demonstrated above, PC 6 and LI 4 acupoints acupressure can decrease heart rate, allay excitement, relieve chest pain and reduce oxygen consumption, which was the compelling explanation for HVS treated by acupressure. Hence, we speculate that PC 6 and LI 4 acupoints acupressure may be useful for alleviating HVS. However, our speculation should not be regarded as definitive evidence of current therapy, and large-scale, prospective, epidemiological trials are needed to support this speculation.

Conflict of Interest

The authors have no conflicts of interests.

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