

Heat sensitisation in suspended moxibustion: features and clinical relevance

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Received 6 June 2013

Accepted 7 August 2013

ABSTRACT

We have observed a 'heat-sensitisation' phenomenon in a large proportion of patients receiving suspended moxibustion treatment. Patients become thermally sensitised to moxibustion stimulation at certain locations on the body, indicated by sensations of strong warmth or heat penetrating into the body (heat penetration), warmth spreading around the stimulation site (heat expansion), warmth conducting in certain directions and reaching some body regions or even internal organs remote from stimulation sites (heat transmission), or other non-thermal sensations such as aching, heaviness, pressure etc. These heat-sensitised locations are not fixed, but may, during the progression of disease, dynamically change within a certain range centred on acupuncture points. Each condition seems to have its specific set of such sensitised acupuncture points and such phenomena are not commonly observed in other body regions or in healthy subjects. A number of clinical trials have shown that the appearance of heat sensitisation is correlated with better therapeutic effects in various diseases, indicating the clinical significance of such responses. Further investigation is required to elucidate the epidemiological characteristics and biological mechanisms of the heat sensitisation in suspended moxibustion.

HEAT SENSITISATION IN SUSPENDED MOXIBUSTION: FEATURES

Moxibustion has been used in China for over 2000 years to treat a variety of diseases such as pain, asthma and gastrointestinal disorders. It uses thermal stimulation and can be performed in several ways. Suspended moxibustion stimulates acupuncture points with heat generated from burning moxa 3–5 cm away from the body. Patients feel local warmth without burning pain, and may

experience mild hyperemia in the local region.^{1 2}

In our clinical practice, we have discovered and reported a heat-sensitisation phenomenon during suspended moxibustion.^{1–6} Patients with a wide range of diseases may become sensitised to suspended moxibustion stimulation at certain locations on the body. Unlike healthy subjects, who usually perceive only local warmth upon moxibustion, patients with heat sensitisation experience strong warmth or heat spreading around the stimulating site or penetrating into the body, which is quite frequently accompanied with pleasant feelings. The sensitised locations are not always acupuncture points anatomically, but may dynamically change within a certain range centred on acupuncture points during the progression of disease. Each disease has a specific set of such sensitised acupuncture points and such phenomena are not commonly observed in other body regions or in healthy subjects. Heat sensitisation occurs in approximately 10% of healthy populations receiving suspended moxibustion.^{1 2} Under morbid conditions, in contrast, the occurrence rate may reach about 70%, regardless of disease duration.^{1 2} These responses gradually disappear with disease recovery.

We have characterised several types of heat-sensitisation responses, which may appear alone or in combination, below.

'Heat penetration'

This is one of the most commonly observed heat-sensitisation phenomena. When corresponding acupuncture points are stimulated by suspended moxibustion, patients report heat penetrating from the

To cite: Xie D, Liu Z, Hou X, et al. *Acupunct Med* Published Online First: [please include Day Month Year] doi:10.1136/acupmed-2013-010409

skin into subcutaneous tissues and even internal organs in the chest and abdomen. Patients perceive warmth or heat on the skin surface, and report heat sensations in these deep tissues as well.

'Heat expansion'

Another common type of heat sensitisation is heat expanding away from the stimulation site to surrounding cutaneous and subcutaneous tissues, in contrast to the localised surface warmth observed in normal conditions. The expansion range can be up to 10 cm in diameter.

'Heat transmission'

Patients perceive a stream of heat conducting in certain directions, or perceive heat in some body regions or even internal organs remote from stimulation sites.

Non-thermal sensations

Instead of thermal sensations, some patients perceive aching, heaviness, pain, numbness, pressure, or cold in local or distant locations of stimulation. The non-thermal sensations during moxibustion mimic *de qi* responses in acupuncture.⁷ They rarely occur alone, but frequently coincide with other heat-sensitisation responses.

HEAT-SENSITISATION IN SUSPENDED MOXIBUSTION: CLINICAL RELEVANCE

The above observations during suspended moxibustion resemble descriptions in several ancient Chinese medical literatures such as *Huang Di Nei Jing* (the Yellow Emperor's Internal Classics),⁸ where such heat-sensitisation phenomena are described as 'disease responses upon thermal stimulation'. However, little is known about the relationship between heat sensitisation and therapeutic effects. Most practitioners perform suspended moxibustion at fixed acupuncture points, regardless of the presence or absence of heat-sensitisation responses from patients. However, our observation that the responsive site(s) may dynamically change with disease progression raises the question of whether performing moxibustion at these functionally sensitised points would yield better therapeutic effects than at anatomically fixed acupuncture points. We and others have performed a series of clinical trials that verified this hypothesis.

Chen *et al*⁹ reported that performing suspended moxibustion at DU14 and DU24 showed significant therapeutic effects against cervical spondylopathy of vertebral artery type. When all patients were divided into two groups based on the presence or absence of heat sensitisation, those with heat sensitisation showed significantly better clinical outcome in the relief of dizziness and neck and shoulder pain than those without. In other words, the presence of heat-sensitisation phenomena was closely related to

curative effects. With a similar experimental design, Zhang¹⁰ showed that the appearance of heat-sensitisation responses yielded better effects against primary dysmenorrhoea when suspended moxibustion was applied at CV4. At 3-month follow-up, patients with heat sensitisation, but not those without, showed little relapse.

The above studies performed moxibustion at fixed acupuncture points for all patients and differentiated these subjects based on the presence and absence of heat sensitisation. Some others specifically tested the effects of moxibustion at heat-sensitised sites (heat-sensitive moxibustion). Tang *et al*¹¹ directly compared conventional moxibustion at fixed acupuncture points with moxibustion specifically at sensitised sites in patients with prolapse of lumbar intervertebral disc, and reported a higher recovery rate in patients with heat-sensitive moxibustion (70.0% vs 46.7%). Kang *et al*¹² treated 40 cases of knee osteoarthritis with suspended moxibustion. The patients were divided into a heat-sensitised moxibustion group and a conventional moxibustion group. The former group showed a much higher recovery rate (80.95% vs 21.05%). Similar results were also obtained for chronic diarrhoea,¹³ cervical spondylotic radiculopathy,¹⁴ knee osteoarthritis^{3 15} and persistent asthma.¹⁶ An additional factor that may affect the therapeutic outcome is duration of treatment. In a recent study, Chen *et al*⁴ performed 18 sessions of heat-sensitive moxibustion in patients with lumbar disc herniation over 2 weeks. In one group, the duration of each session was fixed to 15 min. In the other group, each moxibustion session was not terminated until the heat-sensitisation responses disappeared. Significantly better effects were obtained in the latter group.

All these clinical data point to a strong association between heat-sensitisation phenomena and the therapeutic effects of moxibustion. Performing moxibustion for sufficiently long periods at heat sensitised positions would be a more rational strategy than doing so at fixed acupuncture points for fixed durations.

CONCLUSIONS

In summary, suspended moxibustion at certain body locations elicits heat sensitisation. Although applying stimulation at fixed acupuncture points yields some therapeutic effects, moxibustion at the sensitised sites showed better efficacy in a number of diseases, suggesting the clinical significance of these responses. Further investigation is required to reveal the accurate prevalence, location and specificity of these sensitised sites under different conditions, and to elucidate the underlying biological mechanisms.

Contributors RC obtained funding for the research project. DX and ZL wrote the manuscript. MY, BZ, XH and JX collected literature and clinical evidence. All authors read and approved the final manuscript.

Funding This study was supported by the Major State Basic Research Development Program of People's Republic of China (Grant number: 2009CB522902) and the National Natural Science Foundation Project of China (81160453) to RC.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

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Acupunct Med published online September 5, 2013
doi: 10.1136/acupmed-2013-010409

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