Western medical practitioners often express scepticism about the role and validity of acupuncture as a therapeutic technique, despite the fact that it has been a part of traditional Chinese medicine (TCM) practice for more than 2000 years. Their uncertainty reflects in part difficulties that have been experienced in providing convincing proof to support the wide-ranging claims made regarding the benefits of acupuncture that it can be applied for the treatment of a seemingly endless list of conditions, extending from infectious diseases, to cancers, to metabolic, psychiatric, and other illnesses (1). It also reflects apparent discrepancies between TCM theories about the supposed mechanisms of action of acupuncture and Western science, which has been unable to find histological or physiological evidence for concepts such as qi and the theory of meridians.

Despite the scepticism, over time, compelling evidence has accumulated that acupuncture is indeed an effective treatment for at least a small number of conditions, including notably pain syndromes and nausea (2, 3). In addition, physiological studies, enhanced by the advent of reliable animal models, have suggested a range of possible pathways of action, even if uncertainty has persisted about the specificity of the effects seen with respect to particular acupuncture points and techniques. The pathways are now thought to comprise a range of mechanisms at various sites of action, including peripheral (eg, axon reflexes, neuropeptides, local endorphins), spinal (eg, gate control, propriospinal inhibition, etc), supraspinal (eg, sympathetic nervous system and effects on the hypothalamic-pituitary-adrenal [HPA] axis), and central (eg, paraventricular nuclear, locus ceruleus, periaqueductal gray, and cortical) (4–6).

Among the clinical conditions, about which claims of benefit from acupuncture have been made but which have remained controversial, are anxiety and depressive states. It is well recognized that many sufferers of these conditions use complementary and alternative medicines (7) and that a number of studies have supported the possibility of beneficial effects. However, a systematic review in 2007 concluded that, despite the positive findings, methodological deficiencies limit the conclusions that can be drawn about the efficacy of acupuncture in the treatment of anxiety and depression, (8) and especially the ability to exclude placebo or “expectancy” effects (9). It is agreed that, as with the other conditions, there remains a need for improved methodologies, larger studies, better standardization of treatments, and more rigorous control processes.

On the other hand, an expanding body of evidence has supported claims for a physiological basis for an effect of acupuncture on stress responses and anxiety. Functional magnetic resonance imaging studies in humans have demonstrated activation of specific central nervous system pathways known to be associated with pain perception and stress, including the limbic system and subcortical gray structures (10). Animal models focusing on a limited number of clearly defined acupuncture points, including, especially, the so-called stomach 36 (St36) (also known as Zusanli) point, have assisted with the standardization of experimental procedures and supported the generation of an array of commensurable data. Studies of St36, in both humans and animal models, have shown effects on the HPA system and other brain structures, mediated through changes in neuropeptide Y expression and a variety of other neurotransmitters, endogenous opioid-like substances, and second messenger pathways (11–14).
The article by Eshkevari et al (15) adds important new information to our knowledge about the actions of acupuncture in the settings of stress and anxiety states. The authors use a well-established model for studying the hormonal responses to stress, the rat cold-stress model, and test the effects of electrical acupuncture (EA) at St36 on HPA activity and behavioral outcomes.

In previous work, the authors have shown that pre-treatment with EA at St36 prevents increases in HPA activity normally induced by cold stress (16). In the present study, they examine whether the same effects are seen when acupuncture is commenced after the onset of the stress, obviously, of potential importance when considering a therapeutic role in humans. They show that EA delivered at St36 blunts the CRH and cortisol responses to cold stress and reduces behavioral anxiety responses, as assessed using a forced swimming test and an open-field test. The hormonal effects of long-term acupuncture treatment continue for a prolonged period after its cessation despite continuation of the stress. Coadministration of the glucocorticoid receptor antagonist mifepristone, however, does not alter the efficacy of acupuncture at St36, suggesting that acupuncture acts through central mechanisms independent of effects on hormonal productions.

These results demonstrate elegantly that EA at the St36 location in rats is effective in modifying both hormonal and behavioral responses to cold stress. The effects are central in origin and independent of activity at the glucocorticoid receptor. Although the studies are far removed from clinical conditions in humans, they do raise the possibility that precisely targeted acupuncture may well convey efficacy for the attenuation of both hormonal and behavioral responses to stressful stimuli more widely.

Modern acupuncture research is beginning to reveal mechanisms underlying effects well recognized in TCM for thousands of years. Many questions remain. How are the effects of acupuncture conveyed from the site of application to the central location of action? Is acupuncture administered at different locations associated with different, and distinctive, hormonal outcomes? How closely do rat studies using specific acupuncture points correlate with human responses? How can clinical studies of acupuncture be improved to overcome the methodological deficiencies that have limited them for so long in order to provide more precise guidance for therapeutics? There is still a long way to go, but the jigsaw puzzle is at last coming together.

Acknowledgments

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Disclosure Summary: The author has nothing to disclose.

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