A potential mechanism underlying the effects of acupuncture on insulin resistance

Dear Editor,

Acupuncture is a traditional strategy with therapeutic use for the treatment of various diseases and pathological disorders. Recently, we read with great interest the excellent review by Martinez and Peplow, in which the authors demonstrated that acupuncture has the potential to improve insulin resistance and provide physiological benefits in diabetes mellitus (DM). We appreciate and totally agree with this conclusion; however, we would like to put forward a scientific hypothesis regarding the role of adipomyokines in the effects of acupuncture in the treatment of insulin resistance and DM.

DM is widely recognised as a metabolic disease that is characterised by insulin deficiency and/or resistance. In addition to antidiabetic agents, regular exercise and diet control, acupuncture has gradually been accepted as an adjuvant therapy for DM and other metabolic disorders. However, its therapeutic mechanisms have not been fully determined.

Skeletal muscle and adipose tissue both act as endocrine organs capable of secreting a number of bioactive molecules. Interestingly, increasing evidence implies adipomyokines (which consist of adipokines and myokines, are physiologically influenced by exercise, and are separately produced by adipose tissue and skeletal muscle) in the pathogenesis of DM and the therapeutic mechanisms underlying management options. It has been reported that regular exercise activates the production and release of adipokines and myokines, both of which are involved in mediating its beneficial effects on DM and insulin resistance.

Although there is no literature reporting on the effects of acupuncture on adipomyokines, we hypothesise that treatment of insulin resistance and DM using acupuncture may be associated with their upregulation. A previous study by Su et al showed that acupuncture combined with electrical stimulation is effective at alleviating diabetes-induced muscle atrophy via activation of muscle regeneration, suggesting that acupuncture can, at least partially, stimulate the bioactivity of peripheral tissues including skeletal muscle and adipose tissue in a manner that resembles the effects of physical exercise. Therefore, we may infer that adipomyokines originating from muscles and adipose tissues could be upregulated by acupuncture.

In summary, current evidence suggests that acupuncture may represent an effective strategy to improve insulin resistance and help manage various metabolic disorders. Moreover, adipomyokines, which are produced by activation of skeletal muscle and adipose tissue in response to physical exercise, may possibly contribute to the beneficial effects of acupuncture in metabolic diseases. Further detailed studies focusing on the specific role of adipomyokines within the therapeutic mechanisms of acupuncture in this context are required.

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