

The Science of Acupuncture

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Acupuncture has been used in traditional Chinese medicine for over 2,000 years. In the Western world, acupuncture has been a highly controversial therapy, mostly due to the lack of scientific explanations for its mechanisms of action. Nevertheless, acupuncture has become increasingly accepted, having spread worldwide and having become a frequently sought-after alternative therapy.

In 1997, the National Institutes of Health (NIH) Consensus Development Program recognised acupuncture as a therapeutic intervention of complementary medicine. The World Health Organisation (WHO) now recommends the use of acupuncture for treatment of numerous diseases and symptoms associated with cardiovascular, neurological, musculoskeletal, respiratory, gastrointestinal, gynaecological and psychological disorders.

It is estimated that 3 million adults in the USA receive acupuncture treatments each year, with chronic pain being the most common reason for seeking this therapy. In fact, the efficacy of acupuncture in diverse painful conditions is now widely recognised, having earned the denomination "acupuncture analgesia". An estimate of 50% to 85% of chronic pain patients seem to benefit from acupuncture.

Although acupuncture analgesia may have an important psychological component, increasing evidence has been demonstrating that the analgesic effect of acupuncture may indeed be due to a physiological action. The increasingly generalised use of acupuncture has stimulated research on the physiological and biochemical mechanisms underlying acupuncture analgesia. In the last decades, there has been a rapid development of our knowledge of the neurological processes induced by acupuncture. Although a consensual theory is still lacking, many hypotheses have been proposed for the mechanisms of acupuncture analgesia.

Acupuncture points seem to be special sites with denser sensory innervation and connective tissue, and a richer content of TRPV1 receptors, which are important players in pain mechanisms. The insertion of a needle into these points acts as a mechanical stimulus that activates the mechanoreceptors and sends afferent signals to the central nervous system, to areas involved in pain processing. Neurochemical processes of pain modulation are consequently activated, inducing acupuncture analgesia.

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Both clinical and laboratory data indicate that the endogenous opioid system participates in acupuncture analgesia. In fact, a reduced need for opioid-like-medication in patients with chronic pain after acupuncture treatment has been reported. The noradrenergic system has also been associated with acupuncture analgesia in experimental studies, where a decreased level of noradrenaline in the brain was observed after acupuncture-induced analgesia. Studies in animal models of inflammatory and neuropathic pain have also found evidence for a role of serotonin and glutamate in acupuncture analgesia. Other pain mediators that have been suggested to be modulated by acupuncture include somatostatin, cannabinoids, and neurotrophic factors. However, clinical studies supporting these theories are still lacking.

Experimental models of pain have also indicated that acupuncture may have an anti-inflammatory action by having a modulatory effect on the release of pro-inflammatory mediators. These results have been supported by clinical findings showing a reduction in the production of pro-inflammatory molecules after acupuncture in patients with osteoarthritic pain and chronic pelvic pain syndrome.

Despite these recent advances in the understanding of the mechanisms of acupuncture analgesia, there is still a lot of ground to break. What seems to be clear is that, regardless of how that happens, acupuncture works. And there's no harm in trying it.

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