

Acupuncture and its Integrative Role in Managing Cancer-related Symptoms

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Introduction

Cancer treatment, including chemotherapy, radiation therapy and surgical interventions, can result in various adverse effects such as pain, nausea, fatigue and emotional distress. While pharmacological treatments are commonly employed, they are not always effective and can introduce additional side effects. Acupuncture, an ancient practice rooted in inserting fine needles into specific points on the body to restore balance and alleviate symptoms. This review examines the role of acupuncture in managing cancer-related symptoms, exploring its mechanisms, clinical evidence and integration into modern cancer care.

Description

Neurotransmitter regulation is a crucial mechanism through which acupuncture exerts its effects. Neurotransmitters are chemical messengers that transmit signals across synapses in the nervous system, influencing various physiological and psychological processes. Acupuncture may modulate neurotransmitter levels, thereby affecting pain perception, mood and other symptoms associated with cancer and its treatment. Acupuncture is believed to stimulate the release of endogenous opioids, such as endorphins and enkephalins, which act as natural painkillers. These neurotransmitters bind to opioid receptors in the brain and spinal cord, reducing the perception of pain and enhancing pain relief. This neurotransmitter plays a critical role in mood regulation and emotional stability. Acupuncture may increase serotonin levels or enhance serotonin receptor sensitivity, contributing to reduced anxiety, depression and improved overall mood in cancer patients. Dopamine is involved in the regulation of mood, motivation and pleasure. By modulating dopamine levels, acupuncture may help alleviate symptoms of depression and fatigue, enhancing the patient's overall sense of well-being. GABA is an inhibitory neurotransmitter that helps calm the nervous system and reduce anxiety. Acupuncture may influence GABAergic activity, contributing to decreased anxiety and improved emotional regulation [1].

Clinical evidence

- Clinical studies have shown that acupuncture can increase the release of endorphins and enkephalins, leading to significant pain relief in cancer patients. For example, a study found that acupuncture was effective in reducing chronic pain and improving quality of life in patients with cancer.
- Research indicates that acupuncture can positively influence serotonin and dopamine levels, potentially alleviating symptoms of depression and anxiety. A meta-analysis by Lee reported that acupuncture had a moderate effect on reducing anxiety and

depression in cancer patients.

- Acupuncture's impact on neurotransmitters such as dopamine and serotonin may contribute to its effectiveness in reducing cancer-related fatigue. A study found that acupuncture significantly reduced fatigue and improved mood in breast cancer survivors undergoing chemotherapy [2].
- By regulating neurotransmitters, acupuncture can provide complementary relief for symptoms such as pain, anxiety and depression, which are common in cancer patients.
- Understanding the specific neurotransmitter changes induced by acupuncture can help tailor treatment plans to individual patient needs, optimizing symptom management.
- Acupuncture's effects on neurotransmitter regulation support its integration with conventional cancer treatments, offering a holistic approach to symptom management [3].

The practice may enhance immune function by affecting cytokine levels and immune cell activity, potentially improving the body's response to cancer treatment. Acupuncture's influence on the immune system is an important aspect of its therapeutic effects, particularly in the context of cancer care. The immune system plays a crucial role in both the progression of cancer and the body's response to cancer treatments. By modulating immune function, acupuncture may enhance overall treatment outcomes, reduce side effects and improve patient quality of life [4].

Mechanisms of immune system modulation

- Acupuncture has been shown to affect cytokine production. Cytokines are signaling molecules that mediate and regulate immune responses. Research suggests that acupuncture can modulate the levels of pro-inflammatory cytokines (such as TNF-alpha and IL-6) and anti-inflammatory cytokines (such as IL-10), potentially reducing inflammation and promoting a balanced immune response.
- Acupuncture may influence the activity and distribution of various immune cells, including T-cells, B-cells and Natural Killer (NK) cells. Enhanced NK cell activity, for instance, can improve the body's ability to target and destroy cancer cells. Studies have reported that acupuncture can increase the number and activity of these cells, supporting its role in immune modulation [5].
- Chronic stress can negatively impact immune function by increasing the levels of stress hormones such as cortisol. Acupuncture may help lower stress hormone levels, thereby mitigating their adverse effects on immune function and enhancing the body's overall immune response.
- Acupuncture may influence the interaction between the nervous and immune systems. By stimulating specific acupoints, acupuncture can affect neural pathways involved in immune regulation, leading to improved immune responses and reduced immune-related symptoms.

Clinical evidence

- Several studies have demonstrated that acupuncture can enhance immune function in cancer patients. For example, a study found that acupuncture increased the activity of NK cells in breast cancer patients undergoing chemotherapy.

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- Acupuncture's ability to modulate cytokine levels has been linked to reduced inflammation. A study showed that acupuncture could lower inflammatory cytokines and improve immune function in women with polycystic ovary syndrome, which may have implications for similar effects in cancer patients.
- Research suggests that acupuncture can mitigate some of the immunosuppressive effects of conventional cancer treatments. A study reported that acupuncture helped alleviate chemotherapy-induced leukopenia, a condition characterized by reduced white blood cell counts, thereby supporting immune function during treatment.

Implications for cancer care

- Acupuncture's ability to modulate immune function makes it a valuable complementary therapy in cancer care, potentially enhancing the efficacy of conventional treatments and improving patient outcomes.
- By reducing inflammation and supporting immune function, acupuncture may help alleviate side effects associated with cancer treatments, such as infections and immune system compromise.
- Acupuncture into cancer care provides a holistic approach to managing symptoms and supporting overall health, addressing both physical and emotional aspects of patient well-being.

Conclusion

Acupuncture presents a valuable complementary approach to managing cancer-related symptoms, offering potential benefits in pain relief, nausea control, fatigue reduction and emotional support. While current evidence supports its efficacy, further research is necessary to solidify its role and optimize its integration into cancer care. A collaborative, patient-centered approach is essential for maximizing the benefits of acupuncture and improving overall patient outcomes in cancer treatment. Numerous studies have demonstrated that acupuncture can effectively reduce cancer-related pain. For instance, a systematic review by showed that acupuncture significantly reduced pain in cancer patients compared to control groups. Research using neuroimaging techniques has revealed that acupuncture can activate brain areas involved in pain modulation, such as the periaqueductal gray matter and the thalamus. A study byfound that acupuncture modulated brain activity associated with pain processing in patients with chronic pain.

Clinical trials have shown that acupuncture can be a valuable adjunct to conventional pain management strategies. A study found that acupuncture provided additional pain relief and reduced the need for analgesic medications in cancer patients undergoing chemotherapy. There is a need for standardized protocols and methodologies in acupuncture research to enhance the reliability and comparability of results. Ensuring the quality and consistency of acupuncture practices and training is crucial for maintaining efficacy and safety. More high-quality, large-scale clinical trials are needed to confirm the benefits of acupuncture and identify optimal treatment protocols. Studies have demonstrated that acupuncture can be effective in reducing cancer-related pain, including pain associated with chemotherapy and metastatic disease. Acupuncture, particularly at specific points such as P6 (Neiguan), has shown efficacy in alleviating nausea and vomiting induced by chemotherapy. Evidence suggests that acupuncture may help reduce cancer-related fatigue, improving overall energy levels and quality of life. Acupuncture has been associated with reduced symptoms of anxiety and depression in cancer patients, contributing to better emotional well-being.

Acknowledgement

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Conflict of Interest

There are no conflicts of interest by author.

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