

Research Progress on Acupuncture Prevention and Treatment of Senile Depression

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Abstract: *Late-life depression, as a common emotional disorder, significantly affects the quality of life and physical and mental health of older adults. With the intensifying trend of population aging, the search for safe and effective interventions has become a key focus in clinical practice and research. Acupuncture, a traditional Chinese medical therapy, has demonstrated unique advantages in regulating emotions and improving cognitive function. This paper systematically reviews the research progress on acupuncture in the prevention and treatment of late-life depression, covering the theoretical foundations of traditional Chinese medicine, commonly used acupoints and point combinations, clinical research findings, mechanisms of action, and analyses of safety and adaptability. Studies have shown that acupuncture can exert antidepressant effects through multiple pathways, including modulation of neurotransmitters, enhancement of brain functional connectivity, and regulation of immune and endocrine systems. Moreover, it offers good safety and patient acceptability. Despite promising results, current research still faces limitations such as small sample sizes, insufficient mechanistic studies, and lack of standardized treatment protocols. Future studies should focus on multicenter, large-sample, long-term clinical trials to promote the standardization and personalization of acupuncture therapy. In conclusion, acupuncture holds broad prospects and research value in the prevention and treatment of late-life depression.*

Keywords: Late-life depression, Acupuncture therapy, Traditional Chinese medicine theory, Clinical research, Mechanism of action, Safety, Personalized treatment.

1. Introduction

With the global trend of population aging accelerating, mental health issues among the elderly have become a growing concern in the field of public health. Late-life depression, as a common emotional disorder, not only affects the emotional well-being of older adults but is also closely associated with various chronic diseases [1]. Epidemiological studies indicate that the prevalence of depression among the elderly is rising year by year, particularly among those who live alone, are widowed, suffer from chronic illnesses, or have cognitive impairments [2]. Depression significantly reduces the quality of life in older adults and may trigger cardiovascular diseases, diabetes, Alzheimer's disease, and other conditions. It also increases the risk of suicide, posing a serious threat to the safety and social functioning of this population [3].

Although pharmacological treatment plays an important role in managing depression, older adults often have poor drug tolerance and are more susceptible to adverse reactions and drug interactions, especially in the context of multimorbidity and long-term medication use [4]. Therefore, exploring safe, effective, and low-risk non-pharmacological interventions has become a key focus in both clinical practice and research. Acupuncture, as a traditional Chinese medical therapy, is known for its ability to regulate qi and blood, unblock meridians, and calm the mind. It has accumulated rich clinical experience in treating emotional disorders. Its simplicity, minimal side effects, and broad applicability make it particularly suitable for elderly patients.

In recent years, with the modernization of traditional Chinese medicine and the development of evidence-based medicine, research on acupuncture for depression has deepened, encompassing clinical efficacy validation, mechanism exploration, and interdisciplinary integration. Numerous

studies have shown that acupuncture can effectively alleviate depressive symptoms, improve sleep quality, enhance cognitive function, and increase life satisfaction, demonstrating comprehensive therapeutic benefits and safety [5]. Especially among older adults, acupuncture has gained increasing attention and acceptance from clinicians and patients as a gentle and sustainable intervention [6]. This paper aims to systematically review the research progress on acupuncture in the prevention and treatment of late-life depression, exploring its theoretical foundations, clinical applications, mechanisms of action, safety, and adaptability. It also discusses current research limitations and future directions, providing scientific evidence and theoretical support for the broader application of acupuncture in geriatric mental health care.

2. Clinical Characteristics and Current Treatment Status of Late-Life Depression

Late-life depression refers to depressive disorders occurring in the elderly population and presents with distinct clinical features [7]. Compared to younger patients, older adults with depression often exhibit atypical symptoms. Emotional low mood may be less prominent, while symptoms such as loss of interest, social withdrawal, sleep disturbances, and reduced appetite are more common. Some patients primarily complain of physical discomfort—such as headaches, fatigue, and chest tightness—which can easily be misdiagnosed as somatic illnesses [8]. Additionally, cognitive impairments are frequently observed in late-life depression, including poor concentration and memory decline, resembling early signs of dementia and complicating clinical identification. Due to a more reserved emotional expression and the tendency to attribute depressive symptoms to “normal aging” or “physical discomfort,” the condition is often underdiagnosed [9].

Currently, treatment for late-life depression mainly includes pharmacotherapy, psychological interventions, and physical therapies. Selective serotonin reuptake inhibitors (SSRIs) are commonly used first-line antidepressants, known for their relatively good tolerability and safety profile [10]. However, older adults are more sensitive to medications and prone to adverse effects such as gastrointestinal disturbances, arrhythmias, and hyponatremia. The presence of multiple chronic conditions further increases the risk of drug interactions. Psychological therapies such as cognitive behavioral therapy (CBT) and interpersonal therapy (IPT) have shown efficacy in alleviating depressive symptoms in older adults, but their practical application is limited by patients' cognitive abilities, willingness to communicate, and the availability of professional resources [11].

In recent years, physical and alternative therapies have gained increasing attention. Repetitive transcranial magnetic stimulation (rTMS) and electroconvulsive therapy (ECT) have demonstrated good efficacy in some cases of severe depression, but their high cost and technical complexity limit their use in primary care settings [12]. Traditional therapies such as acupuncture, herbal medicine, and music therapy have shown certain advantages in improving sleep and relieving anxiety. Among them, acupuncture, as a distinctive modality of traditional Chinese medicine, is particularly well-suited for older adults due to its minimal side effects and high acceptability [13]. Furthermore, community-based integrated intervention models centered around family physicians are emerging, emphasizing early screening, multidisciplinary collaboration, and personalized treatment. However, these models lack standardized protocols and remain in exploratory stages of implementation [14]. In summary, the treatment of late-life depression still faces challenges such as diagnostic difficulty, poor adherence, and variable efficacy. There is an urgent need to explore safe, effective, and well-accepted interventions. Acupuncture, with its potential to regulate mood, improve sleep, and enhance quality of life, warrants further research and clinical promotion.

3. Traditional Chinese Medicine Theoretical Foundations of Acupuncture in Treating Depression

Traditional Chinese medicine (TCM) has a long-standing understanding of depression. As early as the Huangdi Neijing (Yellow Emperor's Inner Canon), there were discussions on the relationship between emotions and qi dynamics, such as "grief disperses qi" and "anger causes qi to rise" [15]. In TCM, depression is categorized under "Yu Zheng" (depressive syndrome), with pathogenesis primarily involving liver qi stagnation, heart-spleen deficiency, and phlegm-qi obstruction. The liver governs dispersion and emotional regulation; when liver qi is stagnant, emotions become constrained, leading to depression. The heart governs the mind, and the spleen governs transformation; deficiency in both results in poor nourishment of the spirit and emotional decline. Phlegm-qi obstruction hinders the ascent of clear yang and disturbs mental clarity. In elderly individuals, physiological decline and organ deficiency, combined with changes in living environment and social roles, make them particularly susceptible to emotional imbalance and the development of depressive syndromes [16]. Therefore, TCM

treatment of late-life depression emphasizes syndrome differentiation, harmonizing organ function, unblocking qi, and calming the mind.

Acupuncture, as a key therapeutic modality in TCM, operates by stimulating specific acupoints to regulate meridian qi and blood, balance yin and yang, and thereby treat disease. In depression treatment, acupuncture works through mechanisms such as soothing the liver and relieving stagnation, strengthening the spleen and nourishing the heart, and resolving phlegm to calm the spirit [17]. Stimulating acupoints can activate meridian transmission, promote circulation, improve organ function, and regulate emotional states. Modern research has shown that acupuncture affects central nervous system activity, modulates neurotransmitter secretion, and produces physiological effects that alleviate anxiety and depression. Acupuncture treatment emphasizes individualized approaches based on the patient's constitution, condition, and emotional state, reflecting TCM's core principles of holistic perspective and syndrome differentiation [18].

In clinical practice, acupoints with calming, liver-soothing, and spleen-strengthening effects are commonly selected for depression treatment. Frequently used points include Baihui (GV20), Shenmen (HT7), Neiguan (PC6), Taichong (LR3), and Zusanli (ST36). Baihui, located at the top of the head, has the function of raising yang and calming the mind; Shenmen, on the Heart meridian, treats insomnia, anxiety, and palpitations; Neiguan, on the Pericardium meridian, regulates the mind and relieves chest tightness; Taichong, the Yuan-source point of the Liver meridian, is effective in soothing liver qi; and Zusanli, on the Stomach meridian, strengthens the spleen and harmonizes qi and blood [19]. Point combination principles often include "heart-liver harmonization," "spleen-kidney supplementation," and "upper-lower pairing" to enhance therapeutic effects. Additionally, acupoints may be adjusted based on specific symptoms, such as adding Anmian for prominent anxiety or Sishencong for cognitive impairment. Rational acupoint combinations not only reflect TCM theoretical guidance but also improve the precision and efficacy of acupuncture treatment [20].

4. Clinical Research Progress on Acupuncture for Late-Life Depression

In recent years, clinical research on acupuncture for late-life depression has made significant progress both domestically and internationally. In China, studies are primarily conducted in TCM hospitals and general medical institutions, using randomized controlled trials (RCTs) or observational designs to verify the efficacy of acupuncture in alleviating depressive symptoms in older adults [21]. For example, some studies have shown that acupuncture significantly reduces Hamilton Depression Rating Scale (HAMD) scores and improves sleep quality and overall functioning [22]. In terms of efficacy evaluation, clinical studies often adopt multidimensional approaches including scale assessments, symptom observation, and physiological monitoring. Commonly used tools include HAMD, Geriatric Depression Scale (GDS), and Beck Depression Inventory (BDI) to quantify changes in depressive symptoms [23]. Additional measures such as the

Pittsburgh Sleep Quality Index (PSQI) and the SF-36 Quality of Life Scale are used to assess overall health status [24]. Some studies incorporate objective methods like electroencephalography (EEG) and functional magnetic resonance imaging (fMRI) to observe the regulatory effects of acupuncture on brain function. Various acupuncture techniques are employed in treating late-life depression, including traditional body acupuncture, electroacupuncture, scalp acupuncture, and warm acupuncture, each with distinct characteristics. Research indicates that different techniques vary in efficacy, safety, and patient acceptability, necessitating individualized treatment selection [25].

The integration of acupuncture with other therapies has become a key direction in current clinical research. Combining acupuncture with Chinese herbal medicine, psychological interventions, and exercise therapy can produce synergistic effects and enhance treatment outcomes [26]. For instance, acupuncture combined with herbal medicine can simultaneously regulate qi and emotions, while pairing acupuncture with cognitive behavioral therapy (CBT) helps improve negative thought patterns and behaviors [27–28]. Some studies have explored combining acupuncture with antidepressant medications, finding that it can reduce drug dosage while improving efficacy and minimizing adverse effects [29]. This comprehensive treatment model embodies the concept of “multidimensional intervention and holistic regulation,” aligning with the complex pathological conditions of elderly patients and offering new pathways for integrating acupuncture into modern medical systems.

5. Mechanistic Exploration of Acupuncture in Treating Late-Life Depression

The mechanisms underlying acupuncture treatment for late-life depression have become a key focus in integrative medicine research in recent years. From a neurobiological perspective, acupuncture can alleviate depressive symptoms by modulating neurotransmitter levels in the central nervous system [30]. Studies have shown that stimulation of specific acupoints such as Baihui (GV20), Shenmen (HT7), and Neiguan (PC6) can promote the release of serotonin (5-HT), norepinephrine (NE), and dopamine (DA) in the brain, thereby improving emotional states [31]. Additionally, acupuncture has been found to upregulate brain-derived neurotrophic factor (BDNF), enhancing neuroplasticity and neuronal regeneration—an effect particularly beneficial for elderly individuals experiencing mood disorders due to neurodegenerative changes. Some studies also suggest that acupuncture can regulate the hypothalamic-pituitary-adrenal (HPA) axis, reducing cortisol levels and mitigating stress responses, which helps relieve depressive symptoms [32].

The application of functional neuroimaging technologies has provided objective evidence for the mechanisms of acupuncture in treating depression. In recent years, techniques such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) have been widely used to observe the effects of acupuncture on brain function [33]. Research indicates that acupuncture can activate brain regions associated with emotional regulation, including the prefrontal cortex, cingulate gyrus, and amygdala, and improve their functional connectivity. By comparing brain activity before

and after acupuncture, researchers have found that acupuncture enhances the integration of emotional regulation networks in the brain, correcting functional imbalances in depressed patients. These imaging findings not only validate the central regulatory effects of acupuncture but also support its clinical application, promoting the development of more precise and visualized acupuncture therapies [34].

Moreover, the immunological and endocrine regulatory effects of acupuncture have received increasing attention. Depression is often accompanied by chronic inflammation, characterized by elevated pro-inflammatory cytokines such as IL-6 and TNF- α . Acupuncture can modulate immune cell activity and reduce inflammatory markers, thereby improving systemic inflammatory responses and alleviating depressive symptoms [34]. It also influences the endocrine system by regulating levels of thyroid hormones, sex hormones, and other endocrine factors, helping to correct mood disturbances caused by hormonal imbalances [34]. For elderly individuals, acupuncture offers unique advantages in enhancing immune function and optimizing endocrine balance, contributing to improved overall health and psychological well-being. In conclusion, the mechanisms of acupuncture in treating late-life depression are multidimensional and systemic. Future research should strengthen interdisciplinary collaboration to further uncover its deeper physiological foundations.

6. Conclusion

In the treatment of late-life depression, acupuncture has demonstrated promising clinical potential as a safe, non-pharmacological intervention. Given the unique physiological characteristics of older adults—such as loose skin, fragile blood vessels, and diminished immune function—special attention must be paid to acupoint selection, stimulation intensity, and operational standards during acupuncture procedures to ensure safety. Existing studies indicate that adverse reactions to acupuncture are relatively rare and typically mild, including localized pain and subcutaneous bruising. These can be effectively prevented through standardized techniques and individualized adjustments. Moreover, elderly patients generally show high acceptance of acupuncture, especially when long-term pharmacotherapy results in significant side effects or limited efficacy. Acupuncture offers an alternative treatment option that enhances patient compliance and satisfaction.

Despite the progress made in acupuncture research for late-life depression, several limitations remain. Most current clinical studies are small-scale and single-center, lacking high-quality randomized controlled trials, which affects the generalizability and credibility of findings. Mechanistic studies, although covering neurotransmitters, brain imaging, and immune regulation, still require greater depth and systematic exploration. Future research should prioritize multicenter, large-sample, and long-term follow-up clinical trials, while promoting interdisciplinary collaboration to further investigate the biological foundations and pathways of acupuncture. Additionally, issues related to standardization and personalization of acupuncture treatment—such as acupoint selection, stimulation parameters, and treatment duration—need to be addressed to improve consistency and clinical applicability.

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