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Research Progress on Guipi Decoction as an Auxiliary Treatment for Insomnia Due to Deficiency of Both Heart and Spleen

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Abstract: ***Guipi Tang is a traditional Chinese medicine prescription, which has been proved to have good effects in calming the mind, nourishing the heart, replenishing qi and strengthening the spleen in clinical and experimental studies. This article mainly focuses on the common insomnia phenomenon of both heart and spleen deficiency in clinic, and carries out three aspects: the combined application of Guipi Decoction with traditional Chinese medicine, traditional Chinese medicine technology and western medicine. It lists ear point pressing method, acupoint application method, moxibustion, acupoint massage, acupuncture therapy and other treatment methods. This paper systematically expounds the advantages and disadvantages of Guipi Decoction in the application of auxiliary treatment, in order to provide certain theoretical support for Guipi Decoction in the auxiliary treatment of insomnia caused by both heart and spleen deficiency.***

Keywords: Guipi Decoction, Adjunctive Therapy, Insomnia, Heart-Spleen Deficiency, Traditional Chinese Medicine**.**

1. Introduction

Insomnia, the most common clinical manifestation of sleep disorders, is characterized by difficulty in falling asleep and maintaining sleep, leading to non-restorative sleep and impaired daytime functioning [1]. In Traditional Chinese Medicine (TCM), insomnia is referred to as "bùméng", with historical texts such as the "Inner Canon of Huangdi" describing it as "inability to close the eyes," "inability to sleep," and "inability to lie down" [2]. Epidemiologically, insomnia affects approximately 10% of adults in North America, with 20% occasionally experiencing symptoms. Populations at higher risk include women, the elderly, and individuals with socioeconomic challenges [3]. In China, the prevalence among young and middle-aged adults is as high as 21%, indicating a trend towards younger onset [4]. The disorder exerts substantial adverse effects on learning, occupational performance, and overall quality of life, particularly mental health. For instance, drivers with insomnia demonstrate impaired cognitive function and increased accident risk [5]. Longitudinal studies, such as the Canadian Longitudinal Study on Aging, have further established a correlation between insomnia and increased risk of subjective memory decline in middle-aged and older adults [6].

Current therapeutic approaches primarily include sedative-hypnotic pharmaceuticals, cognitive behavioral therapy for insomnia (CBT-I), and TCM interventions [7]. However, long-term use of conventional hypnotics is associated with neuropsychiatric adverse reactions, including dependency, cognitive dysfunction, and delirium [8-9]. Although not an acute critical illness, chronic insomnia significantly impacts mental well-being and is a common manifestation of sub-health conditions [10-11]. Adjunctive therapies such as psychological intervention, electronic biofeedback, and five-element music therapy have also been explored [12-14].

Within TCM theory, insomnia is categorized into several patterns, with Heart-Spleen Deficiency (HSD) being the most prevalent [15-16]. This pattern arises from deficiency of both the heart and spleen. The heart, housing the spirit, governs blood circulation, while the spleen is the foundation of acquired constitution and the source of qi and blood production. Deficiency in the spleen impairs its transportation and transformation functions, leading to inadequate generation of qi and blood. Consequently, the heart lacks nourishment, resulting in restlessness of the spirit and insomnia. Guipi Decoction (GPD), a renowned TCM formula, is specifically designed to address HSD by strengthening the spleen, nourishing the heart, supplementing qi, and enriching blood [17].

Clinical observations suggest that GPD is seldom used as a monotherapy but frequently serves as a foundational or synergistic agent in combination with other TCM modalities or even reduced-dose Western medicine, aiming for enhanced efficacy and long-term management [18]. This review, therefore, seeks to synthesize the current evidence on the adjunctive application of GPD in treating HSD insomnia, with a focus on its combination strategies, efficacy, and potential mechanisms, to inform clinical practice and future research.

2. Pathogenesis of Insomnia in TCM: Heart-Spleen Deficiency

The TCM understanding of health is rooted in the holistic concept, viewing sleep as a vital physiological process where Yang energy enters Yin, achieving a state of balance and embrace. As stated in "Lingshu·Kouwen": "When Yang Qi is exhausted and Yin Qi is strong, the eyes close; when Yin Qi is exhausted and Yang Qi is strong, one awakens." Thus, harmonious interaction between Yin and Yang is fundamental to normal sleep-wake cycles. Insomnia, particularly of the HSD type, primarily involves a failure of Yang to enter Yin

due to underlying deficiency [19].

2.1 The Roles of the Heart and Spleen

The heart governs the blood and houses the spirit. It is the monarch organ responsible for mental activities and consciousness. Emotional disturbances are believed to primarily affect the heart, leading to restlessness of the spirit and subsequent sleeplessness [20]. The spleen, in contrast, is responsible for the transportation and transformation of food and fluids, extracting the essential qi and blood that nourish the entire body, including the heart. The spleen's function of sending the "clear" upwards is crucial for delivering these nutrients to the heart and lungs.

2.2 Pathogenesis of HSD Insomnia

When the spleen is deficient, its ability to transform and transport is compromised. This leads to inadequate production of qi and blood (qi and blood deficiency). The heart, reliant on sufficient blood to house the spirit, becomes undernourished. An undernourished heart cannot properly anchor the spirit, resulting in mental restlessness, anxiety, and insomnia. This interplay creates a vicious cycle: spleen deficiency causes heart blood deficiency, which disrupts sleep, potentially further impacting spleen function through emotional distress [21] (e.g.,overthinking damages the spleen).

The core pathogenesis, therefore, is dual deficiency of the heart and spleen, manifesting as insufficiency of both qi and blood. Key clinical manifestations include difficulty falling asleep, dream-disturbed sleep, easy awakening, palpitations, forgetfulness, fatigue, poor appetite, and a pale complexion [10]. The therapeutic principle focuses on fortifying the spleen, nourishing the heart, supplementing qi, and enriching blood, which is precisely the action of Guipi Decoction.

2.3 The "Body Differentiation-Disease Differentiation - Syndrome Differentiation" Model

The diagnosis and treatment of insomnia in TCM increasingly adopt a integrated model that considers the patient's constitution, the disease itself, and the specific pattern presentation [22]. For HSD insomnia, the disease is insomnia, the common pattern is Heart-Spleen Deficiency, and the constitution often involves a tendency towards qi and blood deficiency. This model allows for a more personalized and precise application of treatments like GPD.

3. Guipi Decoction: Composition, Pharmacology, and Mechanisms

3.1 Historical Origin and Composition

GPD originated from Yan Yonghe's "Jisheng Fang" (Formulas to Aid the Living) during the Song Dynasty, with a history spanning over 770 years. The standard formula comprises [23]:

This herbal formula is designed to tonify Qi, strengthen the spleen, nourish blood, and calm the spirit through a synergistic combination of medicinal herbs. Ren Shen (Radix Ginseng) or Dang Shen (Radix Codonopsis) serves as the primary Qi-tonifying agent, greatly replenishing primordial Qi, while Huang Qi (Radix Astragali) reinforces Qi and stabilizes the exterior. Bai Zhu (Rhizoma Atractylodis Macrocephalae) and Fu Ling (Poria) work in tandem to fortify the spleen, resolve dampness, and promote mental tranquility. Suan Zao Ren (Semen Ziziphi Spinosae) and Yuan Zhi (Radix Polygalae) further enhance the formula's calming effects by nourishing the heart and liver, quieting the spirit, and resolving phlegm to clear the orifices. To address blood deficiency, Dang Gui (Radix Angelicae Sinensis) and Long Yan Rou (Arillus Longan) are incorporated to invigorate and enrich blood, while also supporting the heart and spleen. Mu Xiang (Radix Aucklandiae) ensures smooth Qi movement, preventing stagnation that may arise from excessive tonification. The formula is harmonized by Zhi Gan Cao (Radix Glycyrrhizae Praeparata), and supported by Sheng Jiang (Rhizoma Zingiberis Recens) and Da Zao (Fructus Jujubae), which regulate the spleen and stomach, facilitating the generation of Qi and blood. Together, these herbs create a balanced and comprehensive approach to addressing Qi and blood deficiency, dampness accumulation, and Shen disturbance, making it particularly suitable for conditions involving fatigue, poor digestion, and mental restlessness.

3.2 Formula Analysis and Synergistic Actions

The formula construction is meticulous [24]:

This herbal formulation demonstrates a sophisticated pharmacological strategy that systematically addresses spleen qi deficiency, heart blood insufficiency, and spirit agitation through four synergistic therapeutic groups. The spleen-fortifying and qi-supplementing group, comprising Ren Shen (Radix Ginseng)/Dang Shen (Radix Codonopsis), Huang Qi (Radix Astragali), Bai Zhu (Rhizoma Atractylodis Macrocephalae), and Gan Cao (Radix Glycyrrhizae), functions to tonify spleen qi and enhance digestive function while stabilizing the exterior defensive system. Complementing this, the heart-nourishing and blood-tonifying group - Suan Zao Ren (Semen Ziziphi Spinosae), Long Yan Rou (Arillus Longan), and Dang Gui (Radix Angelicae Sinensis) - works to enrich heart blood and stabilize the spirit, addressing symptoms such as palpitations and insomnia. The spirit-quieting group, consisting of Fu Ling (Poria), Suan Zao Ren, and Yuan Zhi (Radix Polygalae), specifically targets mental agitation through dual mechanisms of dampness resolution and psycho-emotional regulation. Importantly, Mu Xiang (Radix Aucklandiae) serves as a crucial qi-regulating agent that prevents potential stagnation from the rich tonifying herbs, thereby optimizing their assimilation and bioavailability. This carefully balanced combination achieves comprehensive therapeutic effects including qi replenishment, blood generation, spleen strengthening, heart nourishment, and spirit calming, making it particularly effective for conditions characterized by fatigue, blood deficiency, and sleep disturbances associated with qi and blood disharmony. The formula exemplifies the nuanced application of traditional Chinese herbal medicine principles, where multi-target interventions address both the root deficiencies and their clinical manifestations.

3.3 Modern Pharmacological Insights

Systematic reviews and meta-analyses have confirmed that Chinese herbal medicine, with GPD being a prime example, offers a favorable safety and efficacy profile for insomnia treatment compared to conventional hypnotics [25-26]. Modern pharmacological studies suggest that GPD may exert its effects through multiple mechanisms:

Regulating Neurotransmitters: Modulating levels of gamma-aminobutyric acid (GABA), serotonin (5-HT), norepinephrine (NE), and dopamine (DA) to restore the excitatory-inhibitory balance in the central nervous system.

Modulating the HPA Axis: Attenuating hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis, thereby reducing cortisol levels and alleviating stress-related sleep disturbances [27].

Anti-inflammatory and Antioxidant Effects: Reducing pro-inflammatory cytokines and oxidative stress, which are implicated in the pathophysiology of insomnia and its comorbidities.

Nutritional Support: Increasing serum levels of nutrients like 25-hydroxyvitamin D3, which is indirectly associated with improved sleep quality.

These actions align with the TCM concept of addressing the root by strengthening the spleen and nourishing the heart, while also treating the branch by calming the spirit.

4. Combination Therapies of Guipi Decoction

4.1 Combination with Other Chinese Herbal Formulas

In clinical practice, Guipi Decoction (GPD) is often combined with other herbal formulas to enhance its therapeutic effects. For instance, Chaihu Shugan Powder is used to soothe the liver and regulate qi, addressing emotional stress that exacerbates insomnia [28]. Li et al. demonstrated that combining GPD with Chaihu Shugan Powder significantly reduced Pittsburgh Sleep Quality Index (PSQI) scores in patients with heart-spleen deficiency (HSD) insomnia compared to controls. Similarly, Guizhi JiaLonggu Oyster Decoction was found to improve sleep quality by calming the spirit and regulating heart-kidney interactions [29]. Another combination, Baizi Yangxin Pills, with its focus on nourishing the heart and calming the mind, synergized with GPD to reduce both PSQI and modified Epworth Sleepiness Scale (mESS) scores significantly [30].

4.2 Combination with TCM Techniques

4.2.1 Auricular Acupressure

Auricular acupressure involves stimulating specific ear points corresponding to visceral organs. Common points for insomnia include Shenmen (TF4), Heart (CO15), and Spleen (CO13). Huang et al. reported that combining GPD with auricular acupressure improved sleep quality in 48 HSD insomnia patients [31]. However, challenges such as precise point location and patient adherence need addressing in future studies.

4.2.2 Acupoint Application

This method applies herbal patches to acupoints like Yongquan (KI1), which connects the heart and kidney [32]. Dong et al. found that GPD combined with acupoint application at KI1 not only improved sleep efficiency but also increased serum 25-hydroxyvitamin D3 levels, suggesting a potential biochemical mechanism for sleep regulation [33].

4.2.3 Moxibustion

Moxibustion, particularly along the Du meridian (from Dazhui to Yaoshu), warms meridians and strengthens yang. Yao et al. used improved Du moxibustion (Xinshu to Weishu) with GPD, achieving long-term sleep quality improvements [34]. However, safety measures for preventing burns, especially in elderly patients, are crucial [35].

4.2.4 Acupoint Massage

Massage at points like Zusanli (ST36) and Sanyinjiao (SP6) promotes qi flow and relieves fatigue [36]. Wu et al. combined GPD with massage during Chenshi (7:00-9:00) and Qishi (19:00-21:00), corresponding to peak qi in the stomach and pericardium meridians, resulting in reduced TCM syndrome and PSQI scores [37].

4.2.5 Acupuncture

Acupuncture at points such as Shenmen (HT7), Sishencong (EX-HN1), and Yintang (EX-HN3) regulates the nervous system. He et al. used body acupuncture with GPD, significantly increasing total sleep time and reducing PSQI scores [38]. Shang et al. applied the “tri-jiao acupuncture method” with GPD for post-stroke insomnia, alleviating depressive moods and improving sleep [39].

4.3 Integration with Western Medicine

Combining GPD with reduced-dose hypnotics (e.g., zolpidem) mitigates adverse effects while enhancing efficacy. Studies show that such combinations improve short-term insomnia symptoms and reduce dependency risks [40]. This integrative approach aligns with the “dialectical unity” principle, blending TCM’s holistic care with Western medicine’s targeted therapies [41].

5. Limitations and Future Perspectives

“Although promising results have been reported, current research on GPD for HSD insomnia has several important limitations: First, small sample sizes: many studies have limited participants, affecting statistical power. Second, there is a lack of standardization: protocols for TCM techniques (e.g., moxibustion duration, acupuncture points) are inconsistently reported. Moreover, safety reporting remains inadequate: adverse events, such as burns from moxibustion, are underreported. Additionally, nursing implementation presents challenges: TCM techniques are not widely adopted by nurses, limiting scalability. Most importantly, methodological rigor needs improvement: high-quality

randomized controlled trials (RCTs) with long-term follow-ups are scarce.

To address these limitations, future research should focus on: (1) conducting large-scale, multicenter RCTs; (2) standardizing TCM techniques and safety protocols; (3) exploring biochemical mechanisms (e.g., neurotransmitter regulation, HPA axis modulation); and (4) investigating GPD's efficacy in specific populations, such as healthcare workers with shift work sleep disorder."

6. Conclusion

Guipi Decoction, both as a monotherapy and combined with other TCM techniques or Western medicine, demonstrates significant efficacy in treating heart-spleen deficiency insomnia. Its multi-target approach, addressing both TCM pathogenesis and modern biological mechanisms, offers a safe and effective complementary therapy. However, more rigorous studies are needed to validate these findings and facilitate clinical integration.

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