

Auricular Copper Bian Gua Sha Combined with Auricular Acupressure for Insomnia after Glucocorticoid Pulse Therapy in Thyroid-Associated Ophthalmopathy: A Clinical Observation (Post-print)

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Abstract

Objective: To investigate the therapeutic efficacy of auricular copper bian Gua Sha combined with auricular acupressure for insomnia following hormone pulse therapy in thyroid-associated ophthalmopathy.

Methods: A total of 82 patients diagnosed with thyroid-associated ophthalmopathy requiring hormone pulse therapy were randomly divided into a control group and an observation group, with 41 cases in each group. Both groups received methylprednisolone sodium succinate for injection (Methylprednisolone) pulse therapy. The control group received conventional symptomatic treatment, while the observation group received additional treatment with auricular copper bian Gua Sha and auricular acupressure. The improvement of sleep conditions, Pittsburgh Sleep Quality Index (PSQI), and Self-Rating Anxiety Scale (SAS) scores were compared between the two groups.

Results: Two patients in the observation group withdrew from the study. The effective rate of sleep condition improvement in the observation group was 87.18% (34/39), which was significantly higher than that in the control group (41.46%, 17/41), and the difference was statistically significant ($P < 0.05$). The PSQI score of the observation group was lower than that of the control group, with a statistically significant difference ($P < 0.05$). The SAS score of the observation group was (51.16 ± 4.35) points, which was lower than the control group's (54.95 ± 2.30) points, and the difference was statistically significant ($P < 0.05$).

Conclusion: Auricular copper bian Gua Sha combined with auricular acupressure can improve sleep conditions after hormone pulse therapy in

thyroid-associated ophthalmopathy, prevent complications, and promote patient recovery.

Full Text

Curative Effect of Auricular Copper Scraping Combined with Auricular Acupoint Pressing on Insomnia After Methylprednisolone Pulse Therapy for Thyroid-Associated Ophthalmopathy

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Abstract

Objective: To investigate the curative effect of auricular copper scraping combined with auricular acupoint pressing on insomnia following methylprednisolone pulse therapy for thyroid-associated ophthalmopathy.

Methods: A total of 60 patients diagnosed with thyroid-associated ophthalmopathy requiring hormone pulse therapy were randomly divided into a control group and an observation group, with 30 cases in each group. Both groups received methylprednisolone sodium succinate (Solu-Medrol) pulse therapy. The control group received conventional symptomatic treatment, while the observation group received additional auricular copper scraping and auricular acupoint pressing treatment. Sleep improvement, Pittsburgh Sleep Quality Index (PSQI) scores, and Self-Rating Anxiety Scale (SAS) scores were compared between the two groups.

Results: Two patients in the observation group withdrew from the study due to inability to tolerate pain from auricular acupoint pressing. The effective rate of sleep improvement in the observation group was significantly higher than that in the control group ($P < 0.05$). PSQI scores in the observation group were significantly lower than those in the control group ($P < 0.05$). SAS scores in the observation group were also significantly lower than those in the control group ($P < 0.05$).

Conclusion: Auricular copper scraping combined with auricular acupoint pressing can effectively improve sleep quality, prevent complications, and promote recovery in patients with insomnia after methylprednisolone pulse therapy for thyroid-associated ophthalmopathy.

Keywords: thyroid-associated ophthalmopathy; auricular copper scraping; auricular acupoint pressing; insomnia; hormone pulse therapy

Introduction

Thyroid-associated ophthalmopathy, also known as Graves' ophthalmopathy, is an autoimmune inflammatory orbital disease associated with thyroid dysfunction. It primarily manifests as unilateral or bilateral proptosis accompanied by visual impairment, ranking first among adult orbital diseases with an incidence rate of approximately 16 per 100,000 and increasing annually. Studies indicate that over 90% of patients with thyroid disease exhibit varying degrees of ocular manifestations. Without timely treatment, severe cases can result in blindness. Currently, the preferred treatment is high-dose glucocorticoid pulse therapy, which demonstrates significant efficacy but carries notable adverse reactions including insomnia, elevated blood pressure, and increased blood glucose. Patients often experience excitatory states after hormone therapy, severely affecting sleep quality and exacerbating physiological and psychological stress. Conventional sedative-hypnotic medications carry risks of dependency and increased dosing frequency, resulting in low patient acceptance.

Traditional Chinese medicine (TCM) external therapies, including acupuncture, scraping, cupping, auricular acupuncture, acupoint application, herbal fumigation, and medicinal baths, directly stimulate corresponding acupoints to treat disease. These methods have gained increasing acceptance due to their significant efficacy, simple operation, and minimal adverse effects. Auricular acupoint pressing involves applying vaccaria seeds to positive points on the ear to regulate qi-blood balance and maintain yin-yang equilibrium. Copper scraping utilizes a brass bian stone shaped like a tiger tally to scrape auricular acupoints, leveraging copper's thermal conductivity and antimicrobial properties to enhance therapeutic effects through optimal resonance frequency. This study investigates the efficacy of auricular copper scraping combined with auricular acupoint pressing for insomnia following hormone pulse therapy in thyroid-associated ophthalmopathy.

1. Materials and Methods

1.1 Study Participants

We selected 60 patients with thyroid-associated ophthalmopathy admitted to the Integrated Traditional Chinese and Western Medicine Department between January 2020 and June 2021.

Diagnostic Criteria: Based on the Graves' ophthalmopathy diagnostic standard: (1) confirmed diagnosis of hyperthyroidism; (2) diffuse goiter with infiltrative exophthalmos; (3) positive TRAb and TSAbs; (4) positive thyroid autoantibodies.

Inclusion Criteria: (1) Met diagnostic criteria for thyroid-associated ophthalmopathy; (2) Normal cognitive function with ability to communicate and complete questionnaires independently; (3) Voluntary participation with signed informed consent.

Exclusion Criteria: (1) Severe cardiovascular, hepatic, or renal dysfunction; (2) Contraindications for hormone therapy; (3) Abnormal cardiopulmonary function unsuitable for auricular scraping; (4) Ear contour damage or adhesive tape allergy history.

Patients were randomly divided into control and observation groups (30 cases each) using a random number table. The control group included 18 males and 12 females, aged 23-65 years (mean 45.2 ± 8.6 years) with disease duration of 1-8 years (mean 4.2 ± 1.8 years). The observation group included 16 males and 14 females, aged 25-68 years (mean 46.1 ± 9.2 years) with disease duration of 1-9 years (mean 4.5 ± 2.1 years). No significant differences existed between groups in age, gender, or disease duration ($P > 0.05$). This study was approved by the hospital's Medical Ethics Committee, and all patients provided informed consent.

1.2 Treatment Protocol

Both groups received methylprednisolone sodium succinate (Solu-Medrol) pulse therapy. The control group received conventional symptomatic treatment and nursing care: maintaining a quiet ward with soft lighting, wearing sunglasses outdoors, providing 陪护 for patients with vision decline or diplopia, high-calorie and high-vitamin iodine-free diet, adequate water intake, smoking cessation education, medication compliance counseling, and regular eye drops to prevent dryness. Patients with severe eyelid closure insufficiency received sterile gauze coverage during sleep.

The observation group received additional auricular copper scraping and auricular acupoint pressing based on the control group protocol.

Auricular Copper Scraping Procedure: After explaining the procedure and obtaining cooperation, patients emptied their bladder and bowels and assumed a supine position with head turned to one side. Following 75% alcohol cleaning of the auricular skin, a small amount of scraping oil was applied and massaged. Scraping proceeded from bottom to top and outer to inner, covering all auricular areas. Anterior auricle sequence: earlobe, helix, scapha, antihelix, cavum conchae, cymba conchae, triangular fossa, and anterior auricle. Posterior auricle sequence: posterior earlobe, posterior helix tail, posterior helix, posterior antihelix groove, posterior antitragus groove, posterior eminence of cavum conchae, posterior groove of crus of helix, posterior eminence of cymba conchae, posterior groove of inferior antihelix crus, posterior eminence of triangular fossa, and area from posterior auricle to sternocleidomastoid muscle. Key acupoints (Shenmen, Kidney, Heart, Endocrine, Eye) were scraped intensively for 20-30 minutes weekly.

Auricular Acupoint Pressing Procedure: Main acupoints selected: Shenmen, Sympathetic, Kidney, Liver, Spleen, Heart, Eye, and Endocrine. After 75% alcohol disinfection, vaccaria seeds ($0.6 \text{ cm} \times 0.6 \text{ cm}$) were applied to positive points. Patients were instructed to press each point 3-5 times daily

for 1-2 minutes per point until achieving a sensation of soreness, numbness, or distension. Treatment was administered twice weekly. If patients experienced pain intolerance, redness, swelling, heat, or pain exacerbation, the patches were removed immediately.

1.3 Evaluation Criteria

Insomnia Efficacy Standard: Based on the *Criteria of Diagnosis and Therapeutic Effect of Diseases and Syndromes in Traditional Chinese Medicine*: (1) Cured: normal sleep >6 hours with disappearance of accompanying symptoms; (2) Effective: sleep 3-6 hours with improvement of accompanying symptoms; (3) Invalid: no sleep improvement or sleep <3 hours without significant symptom improvement.

Sleep Quality: Assessed using the Pittsburgh Sleep Quality Index (PSQI) administered by uniformly trained nurses before intervention and at 2 weeks post-intervention. The scale includes 7 components: sleep quality, daytime dysfunction, sleep duration, sleep latency, sleep disturbances, sleep efficiency, and hypnotic medication use. Each component scores 0-3 points, with total scores ranging 0-21. Scores ≤7 indicate normal sleep quality, while >7 indicates poor sleep quality.

Psychological Status: Evaluated using the Self-Rating Anxiety Scale (SAS) administered at admission and discharge. SAS contains 20 items, with standard scores <50 indicating no anxiety, 50-59 mild anxiety, 60-69 moderate anxiety, and ≥70 severe anxiety.

1.4 Statistical Analysis

SPSS 22.0 software was used. Measurement data were expressed as mean ± standard deviation ($\bar{x} \pm s$). Independent samples t-test was used for inter-group comparisons, and paired samples t-test for intra-group pre-post comparisons. Rank sum test was used for ordinal data. Statistical significance was set at $\alpha = 0.05$.

2. Results

2.1 Comparison of Insomnia Improvement Between Groups

Two patients in the observation group withdrew due to pain intolerance from auricular acupoint pressing. The final analysis included 28 patients in the observation group and 30 in the control group, with no loss to follow-up. The total effective rate was 93.3% in the control group and 96.4% in the observation group, with a statistically significant difference between groups ($P < 0.05$).

2.2 Comparison of PSQI Scores

No significant difference existed in pre-intervention PSQI scores between groups ($P > 0.05$). Post-intervention PSQI scores were significantly lower in the observation group compared to the control group ($P < 0.05$).

2.3 Comparison of SAS Scores

No significant difference existed in pre-intervention SAS scores between groups ($P > 0.05$). Both groups showed significant decreases in SAS scores post-intervention ($P < 0.05$), with the observation group demonstrating significantly lower scores than the control group ($P < 0.05$).

3. Discussion

Thyroid-associated ophthalmopathy is an autoimmune inflammatory orbital disease associated with thyroid dysfunction. Its pathogenesis remains unclear but involves genetic, environmental, and immune factors, with an incidence of approximately 16 per 100,000. Glucocorticoid pulse therapy is the clinical first-line treatment, effectively controlling disease progression and alleviating ocular symptoms. However, most patients experience excitatory states post-treatment, leading to nocturnal insomnia. Research indicates that continuous insomnia exceeding 7 days can cause significant declines in memory, thinking, and computational abilities, with severe cases developing hallucinations and delusions, seriously threatening normal life. Therefore, effective intervention is crucial to reduce insomnia risk.

With national promotion of TCM in recent years, characteristic TCM therapies have demonstrated significant efficacy, simple operation, and minimal adverse reactions. This study shows that auricular copper scraping combined with auricular acupoint pressing effectively alleviates insomnia and anxiety following hormone pulse therapy, enhancing patient confidence in overcoming disease.

Insomnia belongs to the TCM category of “sleeplessness,” primarily caused by emotional injury, chronic deficiency, excessive five emotions, or improper diet. The *Inner Canon* describes it as “inability to lie down” or “eyes not closing.” TCM theory holds that the ear connects closely with meridians and viscera. The *Lingshu · Kouwen* states: “The ear is where the ancestral tendons gather” and “the twelve meridians all connect to the ear,” establishing extensive connections between the ear and viscera through meridians. Modern medicine suggests that stimulating auricular acupoints produces bidirectional regulation, modulating visceral function and immune capacity. Auricular acupoint pressing, based on TCM and holographic theory, stimulates ear acupoints to regulate meridian function, promote qi-blood circulation, and balance visceral yin-yang. Copper scraping utilizes a brass tiger-tally bian stone, leveraging copper’s thermal conductivity and antimicrobial properties to enhance therapeutic effects through optimal resonance frequency.

This study selected key acupoints including Shenmen, Sympathetic, Kidney, Liver, Spleen, Heart, Eye, and Endocrine. Shenmen, located in the posterior 1/3 of the triangular fossa, provides bidirectional regulation and sedation. Sympathetic, at the intersection of the inferior antihelix crus and helix inner margin, benefits the heart and calms the spirit. The Liver point, in the posterior-inferior portion of the cymba conchae, clears heat, detoxifies, and brightens the eyes. The Spleen point, in the posterior-superior portion of the cavum conchae, nourishes yin-blood and strengthens the spleen. The Heart point, in the central depression of the cavum conchae, nourishes blood and calms the spirit. The Eye point, in the central portion of the earlobe, dispels wind and brightens the eyes. The Endocrine point, within the intertragic notch, regulates meridians and soothes the liver.

Our results demonstrate that the observation group achieved significantly higher effective rates for sleep improvement, lower PSQI scores, and lower SAS scores compared to the control group, consistent with findings from Liu Yanling et al. This confirms that auricular copper scraping combined with auricular acupoint pressing effectively relieves insomnia and anxiety following hormone pulse therapy.

In conclusion, this combined therapy effectively alleviates insomnia symptoms, improves sleep quality, demonstrates high safety, and positively impacts patient recovery. As auricular copper scraping combined with auricular acupoint pressing remains underutilized clinically, future work should expand its application across departments to further validate its efficacy.

Conflict of Interest Statement: The authors declare no conflicts of interest.

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