Research on the Efficacy and Clinical Study of a Topical Gel Synthesized from Chinese Medicinal Herbs Extracts for Dry Eyes, Eye Astringency and Blurred Vision in Middle-aged and Elderly Individuals

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Abstract: This paper systematically investigates the therapeutic effects of Macau Shuyanning topical gel synthesized from extracts of Chinese medicinal herbs including Panax ginseng, Dendrobium officinale, Lycium barbarum, Cassia obtusifolia, Chrysanthemum morifolium, Ligusticum chuanxiong, Salvia miltiorrhiza, kudzu root, pearl, and Astragalus membranaceus on dry eyes, eye astringency, and blurred vision in middle-aged and elderly individuals. A randomized, double-blind, placebo-controlled clinical trial conducted in 2023 at the Affiliated Hospital of the Faculty of Medicine, Osaka City University, Japan confirmed that the compound gel exhibits excellent efficacy against dryness and astringency in the eyes of middle-aged and elderly subjects. After 3 months of use, the treatment group showed an effective rate of 89.5%, compared with 12.5% in the control group using a placebo gel. The difference in efficacy between the two groups was significant and statistically meaningful ($P<0.05$), with no adverse reactions observed in either group. Additionally, another randomized, double-blind, placebo-controlled clinical trial conducted in 2024 at the same institution confirmed the gel's remarkable therapeutic effect on blurred vision in middle-aged and elderly individuals. After 1 month of use, the effective rate was 94.5% in the treatment group and 25% in the control group, with a statistically significant difference ($P<0.05$) and no adverse reactions in both groups. Conclusion: The topical gel synthesized from extracts of Panax ginseng, Dendrobium officinale, Lycium barbarum, Cassia obtusifolia, Chrysanthemum morifolium, Ligusticum chuanxiong, Salvia miltiorrhiza, kudzu root, pearl, and Astragalus membranaceus demonstrates significant therapeutic effects on dry eyes, eye astringency, and blurred vision in middle-aged and elderly individuals, with good safety, making it worthy of clinical promotion and application.

***Keywords*:** Chinese medicinal herbs extracts; topical gel; middle-aged and elderly; dry eyes and eye astringency; blurred vision

1. Introduction

1.1 Research Background

Current treatments for dry eyes, eye astringency, and blurred vision in middle-aged and elderly individuals mainly include artificial tears, anti-inflammatory drugs, and surgical interventions, but these methods often have limitations. For example, artificial tears only provide short-term relief without addressing the root cause; anti-inflammatory drugs may cause side effects and have limited efficacy with long-term use[4]. Additionally, surgical procedures carry higher risks and are only suitable for specific types of eye diseases. Therefore, exploring a safe and effective treatment has become an urgent issue. This study aims to investigate the improvement effects of a topical compound gel synthesized from extracts of Chinese medicinal herbs such as Panax ginseng, Dendrobium officinale, and Lycium barbarum on dry eyes, eye astringency, and blurred vision in middle-aged and elderly individuals, with the goal of providing new ideas for clinical treatment[5].

2. Key Pharmacology of Chinese Medicinal Herbs

2.1 Panax ginseng

Ginsenosides can improve systemic and ocular blood circulation by promoting the proliferation of vascular endothelial cells and the release of nitric oxide, thereby dilating blood vessels and increasing blood flow[1].

2.2 Dendrobium officinale

Dendrobium polysaccharides can reduce oxidative stress damage to ocular tissues by scavenging free radicals and inhibiting lipid peroxidation, thus delaying the aging and apoptosis of retinal cells[2]. Additionally, Dendrobium has significant anti-inflammatory effects.

2.3 Lycium barbarum

Lycium barbarum polysaccharides (LBP) can significantly improve retinal blood flow through mechanisms such as antioxidation and regulation of vascular factors, indirectly increasing choroidal blood flow[3]. Furthermore, components like carotene and vitamin C in Lycium barbarum can promote tear secretion, alleviate dry eye symptoms, and positively improve visual fatigue and dark adaptation ability.

2.4 Cassia obtusifolia

Anthraquinone compounds in Cassia obtusifolia can protect retinal cells from damage by inhibiting the release of inflammatory factors and reducing oxidative stress, thereby improving vision and delaying eye aging [4]. Additionally, Cassia obtusifolia synergistically enhances choroidal blood flow by dilating retinal blood vessels and regulating intraocular pressure, thus improving ocular blood circulation[5].

2.5 Chrysanthemum morifolium

Flavonoids in Chrysanthemum morifolium can reduce oxidative stress damage to ocular tissues by scavenging free radicals and inhibiting lipid peroxidation, thereby protecting retinal cells and delaying vision decline[4].

2.6 Ligusticum chuanxiong

Ligustrazine can increase ocular blood flow by dilating blood vessels and inhibiting platelet aggregation, thus improving the nutritional supply to the retina and alleviating visual fatigue [6].

2.7 Salvia miltiorrhiza

Tanshinones can increase ocular blood flow by dilating blood vessels and inhibiting platelet aggregation, thus improving the nutritional supply to the retina and alleviating visual fatigue [6].

2.8 Astragalus membranaceus

Astragalus polysaccharides can protect vision and delay the progression of diseases such as age-related macular degeneration by enhancing the activity of antioxidant enzymes, scavenging free radicals, and reducing oxidative stress damage to retinal cells [4].

3. Clinical Trial Data

3.1 Clinical Trial on Dry Eyes and Eye Astringency

A randomized, double-blind, placebo-controlled clinical trial conducted in 2023 at the Affiliated Hospital of the Faculty of Medicine, Osaka City University, Japan, fully validated the excellent therapeutic effect of a topical gel synthesized from extracts of Chinese medicinal herbs including Panax ginseng, Dendrobium officinale, Lycium barbarum, Cassia obtusifolia, Chrysanthemum morifolium, Ligusticum chuanxiong, Salvia miltiorrhiza, and Astragalus membranaceus on dry eyes and eye astringency in middle-aged and elderly individuals.

The trial enrolled 35 patients with dry eye syndrome who visited the hospital between August 2023 and March 2024, and they were divided into a control group (n=16) and a treatment group (n=19) according to the treatment regimen. The average age of the control group was (43.18±8.89) years, and that of the treatment group was (43.59±8.11) years. There were no significant differences between the two groups in terms of gender, age, or disease duration ($P>0.05$).

Exclusion Criteria:

①Patients with comorbid glaucoma, other eye diseases, ocular trauma, or structural abnormalities;

②Patients with abnormal lacrimal gland function;

③Patients with comorbid cardiovascular and cerebrovascular diseases, liver/kidney dysfunction, or other major illnesses;

④Patients allergic to the drugs used in this study;

⑤Pregnant or lactating women.

The control group received a topical gel without any Chinese medicinal substances, while the treatment group received the topical gel synthesized from extracts of the above-mentioned Chinese medicinal herbs. Both groups applied the gel topically around the eyes, wiped it off after 20 minutes, three times daily, for 3 consecutive months.

The clinical efficacy of the two groups was evaluated before treatment and 3 months after treatment.

Markedly Effective: Original symptoms completely disappeared.

Effective: Original symptoms significantly improved.

Not Effective: No improvement in symptoms after treatment.

Total Effective Rate (%) = (Number of Markedly Effective Cases + Number of Effective Cases) / Total Number of Cases × 100%.

Table 1. Clinical Efficacy Evaluation of the Two Groups Before Treatment and 3 Months After Treatment

Group	n	Clinical Efficacy			
		Markedly Effective	Effective	Not Effective	Total Efficacy
Treatment	19	6(31.6%)	11(57.9%)	2(10.5%)	17(89.5%)
Control	16	0(0%)	2(12.5%)	14(87.5%)	2(12.5%)

The effective rates of clinical efficacy in the treatment group and the control group were 89.5% (17/19) and 12.5% (2/16), respectively. The treatment group was far higher than the control group, and the difference was significant and statistically significant (P<0.05).

No adverse reactions occurred in both groups, that is, no corneal injury, eyelid injury, eye pain and other conditions occurred.

3.2 Clinical trial of blurred vision

A randomized, double-blind, placebo-controlled clinical trial conducted in 2024 at the Affiliated Hospital of the Faculty of Medicine, Osaka City University, Japan, fully verified that the external gel synthesized from the extracts of Chinese medicinal herbs such as ginseng, dendrobium, wolfberry, Cassia Seed, chrysanthemum, chuanxiong, salvia miltiorrhiza and astragalus has a good therapeutic effect on blurred vision in middle-aged and elderly people.

The trial selected 34 patients with blurred vision who visited the hospital from February 2024 to July 2024, and they were divided into a control group (n=16) and a treatment group (n=18) according to the treatment plan. Among them, the average age of the control group was (47.23±7.26) years old, and the average age of the test group was (47.56±7.02) years old. There was no obvious difference between the two groups in terms of gender, age and course of disease (P>0.05).

Exclusion criteria: ① Patients with combined glaucoma, other eye diseases such as eye trauma and abnormal tissue structure; ② Patients with major physical diseases; ③ Patients with combined cardiovascular and cerebrovascular diseases, abnormal liver and kidney functions; ④ Patients allergic to the drugs used in this study; ⑤ Pregnant or lactating women.

The control group was given a topical gel without any Chinese medicinal substances, and the test group was given a topical gel synthesized from the extracts of Chinese medicinal herbs such as ginseng, dendrobium, wolfberry, Cassia Seed, chrysanthemum, chuanxiong, salvia miltiorrhiza and astragalus. Both groups applied the topical gel around the eyes, wiped it off after 15 minutes, 3 times a day, and treated continuously for 1 month.

The clinical efficacy of the two groups was evaluated before treatment and 1 month after treatment. Marked effect: the original symptoms completely disappeared; Effective: the original symptoms were significantly improved; Ineffective: the symptoms did not improve after treatment. Total efficacy (%) = (number of marked effective cases + number of effective cases)/total number of cases×100%.

Table 2. Clinical Efficacy Evaluation of the Two Groups Before Treatment and 1 Month After Treatment

Group	n	Clinical Efficacy			
		Markedly Effective	Effective	Not Effective	Total Efficacy
Treatment	18	14(77.8%)	3(16.7%)	1(5.5%)	17(94.5%)
Control	16	0(0%)	4(25.0%)	12(75.0%)	4(25.0%)

The effective rates of clinical efficacy in the treatment group and the control group were 94.5% (17/18) and 25.0% (4/16), respectively. The treatment group was far higher than the control group, and the difference was significant with statistical significance (P<0.05).

No adverse reactions occurred in both groups, that is, no corneal injury, eyelid injury, eye pain and other conditions were observed.

4. Conclusion

4.1 Summary of Research Findings

The Macau Shuyanning topical gel synthesized from extracts of Chinese medicinal herbs including Panax ginseng, Dendrobium officinale, Lycium barbarum, Cassia obtusifolia, Chrysanthemum morifolium, Ligusticum chuanxiong, Salvia miltiorrhiza, kudzu root, pearl, and Astragalus membranaceus demonstrates remarkable therapeutic effects on dry eyes, eye

astringency, and blurred vision in middle-aged and elderly individuals. With good safety, it is worthy of clinical promotion and application.

4.2 Limitations and Prospects of the Study

First, the sample size of this study was limited, and the research duration was relatively short, which may not fully reflect the long-term efficacy and safety of the gel. Second, due to the limitations of the experimental design, the detailed mechanism of action of the gel on specific eye diseases, such as the specific effects on complex conditions like cataracts or glaucoma, was not deeply explored[5]. Future research directions should include expanding the sample size and extending the observation period to evaluate the long-term efficacy and safety of the gel. Meanwhile, targeted research on different types of eye diseases should be strengthened to explore the application potential of the gel in a broader range of indications.

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