Clinical Study on External Application of Scorzonera Herpes Ointment Combined with Methylprednisolone Sodium Succinate for Injection in the Treatment of Herpes Zoster Oticus

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Abstract [**Objectives**] To observe the clinical efficacy of external application of Scorzonera Herpes Ointment combined with Methylprednisolone Sodium Succinate for Injection in the treatment of herpes zoster oticus (HZO). [**Methods**] A total of 100 HZO patients admitted to the 988th Hospital of the Joint Logistics Support Force and Henan Provincial People's Hospital from June 2021 to June 2023 were selected. They were divided into a treatment group and a control group using a random number table method, with 50 cases in each group. Both groups received Methylprednisolone Sodium Succinate for Injection. Additionally, the treatment group was treated with external application of Scorzonera Herpes Ointment, while the control group received acyclovir ointment. Both groups were treated for 10 d. The comparisons included clinical efficacy, total symptom and sign scores, pain level [Visual Analogue Scale (VAS)], time for erythema reduction, cessation of blister formation, scab formation, and scab shedding, incidence of post-herpetic neuralgia (PHN), air conduction hearing threshold, and air-bone gap. [**Results**] After 10 d of treatment, the total effective rate was 98.00% (49/50) in the treatment group and 84.00% (42/50) in the control group, with a statistically significant difference between the two groups ($P<0.05$). After 10 d of treatment, the total symptom and sign scores and VAS scores of both groups decreased compared to those before treatment. The treatment group had significantly lower scores than the control group ($P<0.05$). The treatment group showed significantly shorter time for erythema reduction, cessation of blister formation, scab formation, and scab shedding compared to the control group ($P<0.05$). During the 1-month follow-up after treatment, no PHN cases occurred in the treatment group, while the incidence of PHN in the control group was 24.00% (12/50), showing a statistically significant difference ($P<0.05$). After 10 d of treatment, both groups showed reduced air conduction hearing thresholds, and the treatment group exhibited significantly lower air conduction thresholds and air-bone gaps compared to the control group ($P<0.05$). No statistically significant difference was observed in the air-bone gap before and after treatment in the control group ($P>0.05$). [**Conclusions**] The combination of external application of Scorzonera Herpes Ointment and Methylprednisolone Sodium Succinate for Injection can alleviate pain and other discomforts, reduce PHN incidence, shorten disease duration, and improve hearing in HZO patients.

Key words Herpes zoster oticus, Scorzonera Herpes Ointment, External application, Methylprednisolone Sodium Succinate for Injection, Post-herpetic neuralgia, Hearing

1 Introduction

Herpes zoster oticus (HZO) occurs due to reactivation of the varicella-zoster virus (VZV) latent in the geniculate ganglion of the facial nerve[1]. It is manifested as localized erythema and blisters around the external auditory canal accompanied by severe pain. If not promptly diagnosed and treated in the early stages, viral invasion of the geniculate ganglion of the auditory and facial nerves may lead to severe otalgia, deafness, post-herpetic neuralgia (PHN), and other complications[2-4]. When the motor branch of the facial nerve is involved, signs of facial paralysis such as mouth deviation and incomplete eye closure may occur. Compared to herpes zoster on the trunk, HZO is characterized by more intense pain, rapid progression, and poorer prognosis. Some patients may develop sequelae such as hearing impairment and persistent neuropathic pain after herpes resolution, significantly affecting quality of life. Early aggressive treatment of HZO and peripheral neuropathic pain can protect hearing and reduce PHN incidence[5-8].

Current Western medical treatments for HZO primarily involve antiviral drugs, neurotrophic drugs, and glucocorticoids to eradicate viruses, enhance neural nutrition, and reduce inflammation. However, these treatments carry multiple adverse reactions and have limitations when used alone. In traditional Chinese medicine (TCM), HZO falls under the category of "snake-like sores" (She Chuan Chuang), with treatments mainly including oral herbal medicine and acupuncture[9-11]. However, oral herbal medicine has poor taste and inconvenient decoction processes, while acupuncture may induce fear or anxiety in some patients. Therefore, this study adopted external application of Scorzonera Herpes Ointment for treatment. Scorzonera Herpes Ointment is a hospital-prepared formulation from the 988th Hospital of the Joint Logistics Support Force. It is portable, easy to apply, and has no adverse effects. Preliminary clinical trials have demonstrated that Scorzonera Herpes Ointment exhibits heat-clearing, detoxifying, sore-healing, swelling-reducing, nodule-dissipating, and pain-relieving effects. It alleviates acute-phase herpes zoster pain and reduces PHN incidence[12]. This study investigated the clinical efficacy of combining external application of Scorzonera Herpes Ointment with Methylprednisolone Sodium Succinate for Injection for HZO, as reported below.

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2 Clinical data and methods

2.1 Clinical data

2.1.1 Diagnostic criteria. Skin lesions typically present as unilateral ear involvement, with vesicles visible on the auricle, external auditory canal, and tympanic membrane. The auricular skin may display erythema and clustered herpes vesicles in a band-like distribution, accompanied by peripheral neuralgia[13].

2.1.2 Inclusion criteria. Meeting diagnostic criteria; skin lesions appearing within 5 d; first-time users of Scorzonera Herpes Ointment; no prior antiviral or hormonal therapy; age 18 – 70 years; voluntary participation with signed informed consent.

2.1.3 Exclusion criteria. Severe cardiovascular/cerebrovascular diseases; poorly controlled blood glucose; psychiatric disorders; critical comorbidities; pregnancy or lactation; allergic constitution.

2.1.4 General information. A total of 100 HZO patients treated at the 988th Hospital of the Joint Logistics Support Force and Henan Provincial People's Hospital from June 2021 to June 2023 were enrolled. They were randomly divided into treatment and control groups (50 cases each) using a random number table. Treatment group: 26 males, 24 females; mean age (53.4 ± 4.5) years; mean disease duration (3.0 ± 0.5) d; pain severity: 6 mild, 31 moderate, 13 severe. Control group: 25 males, 25 females; mean age (52.3 ± 4.1) years; mean disease duration (3.0 ± 0.4) d; pain severity: 7 mild, 32 moderate, 11 severe. No statistically significant differences were observed in baseline characteristics between groups ($P > 0.05$), ensuring comparability. This study was approved by the Medical Ethics Committee of the 988th Hospital of the Joint Logistics Support Force (Approval No.: SP20001 V2.0).

2.2 Treatment methods Both groups received intravenous drip therapy with Methylprednisolone Sodium Succinate for Injection (Pfizer Manufacturing Belgium NV, National Drug Approval No. H20080285, specification: 500 mg/vial) 500 mg + 0.9% Sodium Chloride Injection 250 mL, administered continuously for 3 d.

2.2.1 Treatment group. In addition to the intravenous drip of Methylprednisolone Sodium Succinate, the treatment group received external application of Scorzonera Herpes Ointment (Hospital Preparation of the 988th Hospital of the Joint Logistics Support Force) on the affected area. The ointment was applied at a thickness of approximately 0.05 mm twice daily, covered with sterile gauze for 12 h and then removed, for a continuous treatment duration of 10 d.

2.2.2 Control group. In addition to the intravenous drip of Methylprednisolone Sodium Succinate, the control group received external application of Acyclovir Ointment (Jiangsu Yongda Pharmaceutical Co., Ltd., National Drug Approval No. H19993851) on the affected area. The ointment was applied at a thickness of approximately 0.05 mm twice daily, for a continuous treatment duration of 10 d.

2.3 Observation indicators and statistical methods

2.3.1 Observation indicators. (i) Clinical efficacy. Evaluated after 10 d of treatment. (ii) Total symptom and sign scores. Recorded before treatment and after 10 d. The sum of all scores constitutes the total symptom and sign score, with scoring criteria detailed in Table 1. (iii) Time for erythema reduction, cessation of blister formation, scab formation, and scab shedding. Time for cessation of blister formation is defined as the duration until no new blisters appear. (iv) Pain intensity. Assessed using the Visual Analogue Scale (VAS) before treatment and after 10 d. Scores: 0 for no pain, 1 – 3 for mild pain, 4 – 6 for moderate pain, and 7 – 10 for severe pain. (v) Incidence of PHN. Recorded during a 1-month follow-up after treatment completion. (vi) Air conduction hearing threshold and air-bone gap. Measured before treatment and after 10 d.

Table 1 Scoring criteria for symptoms and signs

Symptoms and signs	0 point	1 point	2 points	3 points
Local pain	None	Mild pain	Moderate pain, tolerable	Severe pain, intolerable
Local itching	None	Mild itching	Itching, tolerable	Severe itching, intolerable
Burning sensation	None	Mild heat sensation	Burning pain, tolerable	Severe burning pain, intolerable
Local lymphadenopathy	None	>0.5 cm	0.5 – 1 cm	>1 cm
Number of blisters	None	1 – 10	11 – 25	>25
Number of blister clusters	None	1 – 2	3 – 5	>5
Characteristics of herpes	None or scab exfoliated	Scab	Blisters	Pustules or blood blisters
Ulcers	None	Erosion	Superficial ulcers	Deep ulcers
Papules	None	Reddish	Red but with no edema	Bright red with edema
Skin lesion area (starting at 3 points)	Completely disappeared	Reduction >60%	Reduction 30 – 60%	Reduction <30%

2.3.2 Statistical methods. Data were analyzed using SPSS 26.0 statistical software. Continuous data were tested for normality using the Kolmogorov – Smirnov test. Normally distributed data were expressed as mean ± standard deviation ($\bar{x} \pm s$). Intra-group comparisons used paired *t*-tests, while inter-group comparisons used independent *t*-tests. Categorical data were presented as percentages (%) and analyzed using Chi-square tests. Ordinal data were analyzed with rank-sum tests. A *P*-value < 0.05 indicated statistical significance.

3 Efficacy criteria and treatment outcomes

3.1 Efficacy criteria Established based on the *Criteria for Diagnosis and Efficacy Evaluation of TCM Diseases and Syndromes*[14]. Cure: Complete resolution of skin lesions, disappearance of clinical signs, and no PHN. Improvement: ≥30% reduction in skin lesions compared to pre-treatment, with significant

pain relief. Ineffective: <30% reduction in skin lesions compared to pre-treatment, with persistent pain.

Total effective rate = (Number of cured + improved cases)/Total cases × 100%.

3.2 Comparison of clinical efficacy between groups As shown in Table 2, after 10 d of treatment, the total effective rate was 98.00% in the treatment group versus 84.00% in the control group, with a statistically significant difference ($P<0.05$).

Table 2 Comparison of clinical efficacy between groups ($n=50$, %)

Group	Cured cases	Improved cases	Ineffective cases	Total effective rate
Treatment	33 (66.00)	16 (32.00)	1 (2.00)	49 (98.00)
Control	26 (52.00)	16 (32.00)	8 (16.00)	42 (84.00)
X^2 value				5.983
P value				0.015

3.3 Comparison of total symptom and sign scores between groups As shown in Table 3, no significant difference was observed in total symptom and sign scores between groups before treatment ($P>0.05$). After 10 d of treatment, both groups showed reduced total scores compared to pre-treatment. The treatment group had lower scores than the control group, with statistical significance ($P<0.05$).

Table 3 Comparison of total symptom and sign scores before and after treatment between groups ($\bar{x}\pm s$, $n=50$, points)

Group	Before treatment	10 d after treatment	t value	P value
Treatment	21.18 ± 5.89	4.04 ± 1.97	20.574	<0.001
Control	20.97 ± 5.01	7.76 ± 2.12	18.642	<0.001
t value	0.252	−13.350		
P value	0.946	<0.001		

3.4 Comparison of time for erythema reduction, cessation of blister formation, scab formation and scab shedding As shown in Table 4, the treatment group exhibited shorter durations for erythema reduction, cessation of blister formation, scab formation, and scab shedding compared to the control group, with statistical significance ($P<0.05$).

Table 4 Comparison of time for erythema reduction, cessation of blister formation, scab formation, and scab shedding between groups ($\bar{x}\pm s$, $n=50$, d)

Group	Time for erythema reduction	Time for cessation of blister formation	Time for scab formation	Time for scab shedding
Treatment	3.34 ± 1.78	4.46 ± 2.13	5.87 ± 1.67	9.02 ± 2.45
Control	3.98 ± 1.87	5.41 ± 2.34	7.67 ± 1.84	12.23 ± 3.23
t value	2.420	2.870	6.686	7.026
P value	0.019	0.006	<0.001	<0.001

3.5 Comparison of VAS scores between groups As shown in Table 5, no significant difference in VAS scores was observed between groups before treatment ($P>0.05$). After 10 d of treatment, both groups showed reduced VAS scores compared to pre-treatment, with the treatment group scoring lower than the control group ($P<0.05$).

Table 5 Comparison of VAS scores before and after treatment between groups ($\bar{x}\pm s$, $n=50$, points)

Group	Before treatment	10 d after treatment	t value	P value
Treatment	8.64 ± 1.84	2.81 ± 0.87	22.401	<0.001
Control	8.56 ± 1.81	3.98 ± 1.12	17.890	<0.001
t value	0.307	−9.508		
P value	0.893	<0.001		

3.6 Comparison of PHN incidence between groups During the 1-month follow-up post-treatment, no PHN cases occurred in the treatment group, while 12 cases (24.00%) were observed in the control group, showing a statistically significant difference ($\chi^2=13.636$, $P<0.001$).

3.7 Comparison of air conduction hearing thresholds and air-bone gaps between groups As shown in Table 6, no significant differences in air conduction hearing thresholds or air-bone gaps were observed between groups before treatment ($P>0.05$). After 10 d of treatment, both groups showed reduced air conduction hearing thresholds, and the treatment group exhibited decreased air-bone gaps compared to pre-treatment. The treatment group had lower values than the control group ($P<0.05$). No significant change in air-bone gaps was observed in the control group before and after treatment ($P>0.05$).

Table 6 Comparison of air conduction hearing thresholds and air-bone gaps before and after treatment between groups ($\bar{x}\pm s$, $n=50$, dBnHL)

Group	Time	Air conduction hearing thresholds	Air-bone gaps
Treatment	Before treatment	35.50 ± 4.50	10.10 ± 2.70
	10 d after treatment	15.60 ± 2.20①②	5.10 ± 0.30①②
Control	Before treatment	35.90 ± 4.70	10.50 ± 2.80
	10 d after treatment	21.00 ± 3.10①	10.00 ± 2.40

NOTE ①$P<0.05$ vs pre-treatment in the same group; ②$P<0.05$ vs control group at 10 d post-treatment.

4 Discussion

HZO is a common clinical dermatosis. After VZV infection, the virus may remain latent in dorsal root ganglia and cranial nerve ganglia. Reactivation occurs when host immunity declines. The auricle and external auditory canal are innervated by sensory branches of the facial nerve. Reactivated VZV travels along axons to these regions, manifesting as band-like vesicles, erythema, clustered herpes, and peripheral neuralgia[15-16]. VZV invasion of the auditory nerve and ganglia may cause permanent deafness[17], while facial nerve involvement disrupts motor conduction, leading to facial dysfunction or paralysis[18]. Acyclovir, a purine nucleoside analog, inhibits viral DNA synthesis and exhibits potent antiherpesvirus activity[19-20]. Methylprednisolone Sodium Succinate for Injection, a glucocorticoid, suppresses inflammatory responses, mitigates tissue damage, and modulates excessive immune reactions. Although high-dose glucocorticoids alleviate inflammation, reduce neural edema, and shorten disease duration, prolonged use

may induce lipid and protein metabolic disorders[21]. Therefore, strict control of dosage and duration is essential.

In TCM, HZO is classified as "snake-like sores" (She Chuan Chuang), primarily attributed to external wind-heat pathogens invading collaterals or internal damp-heat accumulation. Damp-heat pathogens are manifested as skin vesicles, while wind-heat pathogens ascending through meridians may cause tinnitus and hearing loss. Scorzonera Herpes Ointment, with Scorzonera as its primary component, clears heat, removes harmful substance, reduces swelling, dissipates nodules, and relieves pain. Modern studies indicate Scorzonera possesses antiviral, anti-infective, analgesic, and immunomodulatory properties[22]. External application of Scorzonera Herpes Ointment allows direct action on lesions without hepatic/renal metabolism, enhancing convenience and efficacy. Results demonstrated higher total efficacy, lower symptom/sign scores, and reduced VAS scores in the treatment group after 10 d. This may relate to analgesic and anti-inflammatory effects of Scorzonera's C-glucosylflavones and 7-methylisoscoparin[22-23]. Shorter time for erythema reduction, cessation of blister formation, and scab shedding in the treatment group may result from Scorzonera's antiviral and wound-healing effects. Studies report that Scorzonera extract disrupts VZV's ability to infect human embryonic lung diploid fibroblast 2BS cells and inhibits viral proliferation[24]. Compared to external application of Acyclovir combined with Methylprednisolone Sodium Succinate for Injection, Scorzonera Herpes Ointment plus Methylprednisolone Sodium Succinate for Injection showed lower PHN incidence. After 10 d, both groups improved air conduction hearing, but only the treatment group showed significant reduction in air-bone gaps. This suggests the external application of Scorzonera Herpes Ointment combined with Methylprednisolone Sodium Succinate for Injection improves both air and bone conduction, facilitating auditory nerve recovery.

In conclusion, external application of Scorzonera Herpes Ointment combined with Methylprednisolone Sodium Succinate for Injection alleviates pain, reduces PHN incidence, shortens disease duration, and enhances hearing, warranting clinical application.

References

[1] JAHR SH, WAHL MS, MAJID B, *et al.* Herpes zoster oticus[J]. Tidsskr Nor Laegeforen, 2021, 141(15). DOI:10.4045/tidsskr.20.0901.

[2] SHENG YJ, HU ZL, ZHANG AP. Analysis of risk factors of postherpetic neuralgia[J]. Dermatology and Venereology, 2021, 43(1): 1-3. (in Chinese).

[3] YANG YW, XU ZW, YAO YC. Clinical efficacy analysis of lidocaine gel patch combined with high-energy red light in the treatment of trunk postherpetic neuralgia[J]. Journal of Clinical and Experimental Medicine, 2022, 21(23): 2575-2577. (in Chinese).

[4] LI LW, WANG XJ, ZHENG BX, *et al.* Comparing the efficacy and safety of high-voltage and standard-voltage pulsed radiofrequency for the treatment of zoster-associated pain: A meta-analysis based on randomized controlled trials[J]. Chinese Journal of Pain Medicine, 2023, 29(1): 24-31. (in Chinese).

[5] TAO L, XIE H. Analysis of analgesic treatment in an elderly patient with postherpetic neuralgia complicated with chronic renal insufficiency[J]. Herald of Medicine, 2023, 42(4): 578-580. (in Chinese).

[6] DING ZY, LI TJ, LONG T, *et al.* Effect of umbilical acupuncture combined medicine therapy in herpes zoster neuralgia[J]. Henan Medical Research, 2021, 30(33): 6261-6264. (in Chinese).

[7] LIU B, ZHANG JS, LU FY, *et al.* Observation on the efficacy of pregabalin in the treatment of postherpetic neuralgia[J]. Dermatology and Venereology, 2022, 44(1): 64-65. (in Chinese).

[8] XIAO YL. Research on medication characteristics of ZHANG Bing-hou in the treatment of postherpetic neuralgia[J]. China Journal of Traditional Chinese Medicine and Pharmacy, 2020, 35(3): 1254-1256. (in Chinese).

[9] XU LW, LIU YL, BAO HL, *et al.* Qufeng Qingre Jiedu Formula combined with acupuncture in treating Ramsay-Hunt syndrome of toxic heat accumulation type: A randomized controlled trial[J]. Hebei Journal of Traditional Chinese Medicine, 2022, 44(11): 1813-1816, 1848. (in Chinese).

[10] MENG CB, YANG T, LIAO Q, *et al.* Clinical effect of acupuncture combined with external application of Zhongyi Paste for herpes zoster oticus with peripheral facial paralysis[J]. Hebei Journal of Traditional Chinese Medicine, 2021, 43(12): 2056-2059, 2089. (in Chinese).

[11] DING XJ, YE XF, NING RR, *et al.* A case of treatment of acute stage otozoster with repeated shallow puncture[J]. Clinical Journal of Chinese Medicine, 2023, 15(15): 92-94. (in Chinese).

[12] SHEN DX, HUANGFU JX, QIN Z, *et al.* Clinical effect of herpes zoster treated with topical Scorzonera Herpes Ointment[J]. China Medical Herald, 2022, 19(34): 80-84. (in Chinese).

[13] Chinese Medical Association. Clinical diagnosis and treatment guidelines: Dermatology and venereology[M]. Beijing: People's Medical Publishing House, 2006: 2-4. (in Chinese).

[14] State Administration of Traditional Chinese Medicine. ZY/T 001.1-001.9-94 Criteria for diagnosis and therapeutic effect of diseases and syndromes in traditional Chinese medicine[S]. Nanjing: Nanjing University Press, 1994: 144. (in Chinese).

[15] XIONG M, LUO ZC. Research progress on epidemiology of herpes zoster[J]. Journal of Clinical Medicine in Practice, 2022, 26(7): 144-148. (in Chinese).

[16] WANG Q, SONG JM, LI Y, *et al.* Study on analgesic effect and mechanism of pulsed radiofrequency thoracic dorsal root ganglion combined with drugs in the treatment of postherpetic neuralgia in elderly patients[J]. Practical Geriatrics, 2022, 36(3): 261-264. (in Chinese).

[17] ZHU Q, FAN BF, ZHANG DY, *et al.* Chinese expert consensus on diagnosis and treatment of peripheral neuropathic pain[J]. Chinese Journal of Pain Medicine, 2020, 26(5): 321-328. (in Chinese).

[18] TANG Y, REN CH, WANG MH, *et al.* Altered gray matter volume and functional connectivity in patients with herpes zoster and postherpetic neuralgia[J]. Brain Research, 2021, 1769: 147608.

[19] HUANG GZ, WANG L, WU JX, *et al.* Comparison of the therapeutic effect of traditional Chinese medicine and western medicine antiviral treatment on herpes zoster[J]. Journal of Hubei Minzu University (Medical Edition), 2021, 38(4): 16-20. (in Chinese).

[20] HUANG Z. Clinical efficacy and adverse reactions analysis of acyclovir combined with methylprednisolone in the treatment of herpes zoster[J]. The Medical Forum, 2021, 25(31): 4504-4506. (in Chinese).

[21] WANG K. Efficacy of adenosine monophosphate combined with glucocorticoid treatment on patients with head and facial herpes zoster[J]. Liaoning Medical Journal, 2024, 38(3): 68-71. (in Chinese).

[22] SHEN DX. Medicinal value of *Scorzonera* L.[J]. China Medical Herald, 2020, 17(18): 41-44. (in Chinese).

[23] BAHADIR ACIKARA Ö, HOŠEK J, BABULA P, *et al.* Turkish Scorzonera species extracts attenuate cytokine secretion via inhibition of NF-κB activation, showing anti-inflammatory effect *in vitro*[J]. Molecules, 2016, 21(1): E43.

[24] ZHOU Y, ZHANG FK, SUN YQ, *et al.* Effect of Scorzonera albicaulis Bunge extract on proliferation *in vitro* of varicella-zoster virus[J]. Chinese Journal of Biologicals, 2022, 35(3): 281-284. (in Chinese).