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Clinical efficacy of stellate ganglion block combined with betahistine hydrochloride in the treatment of vestibular migraine

Jiang Dajing, Zhang Mei*

Jingzhou First People's Hospital, Jingzhou, 434020, Hubei, China
**Corresponding authors*

Abstract: *In this study, 100 patients with vestibular migraine treated in our hospital from January 2022 to January 2024 were selected and divided into experimental group and control group according to their willingness to treat, with 50 patients in each group. The control group was treated with betahistine hydrochloride, and the experimental group was treated with stellate ganglion block combined with betahistine hydrochloride under ultrasound guidance. The level of headache, vertigo symptoms, sleep quality, continuous time of migraine and treatment efficiency were compared between the two groups before and after treatment. The scores of NRS, DHI and PSQI were similar in the two groups before treatment ($P > 0.05$), and the scores of these indexes in the experimental group were lower than those in the control group after treatment ($P < 0.05$). The time of continuous migraine in the experimental group was shorter than that in the control group, and the effective rate of the experimental group was 92.00%, which was significantly higher than that of the control group (80%). Ultrasound-guided stellate ganglion block combined with betahistine hydrochloride is very effective in the treatment of adult vestibular migraine, which can significantly improve clinical signs symptoms such as headache, dizziness, sleep and so on, and has a good promotion value in clinical medicine.*

Keywords: *Ultrasound-guided; Stellate ganglion block; Betahistine hydrochloride; Vestibular migraine; Clinical efficacy*

1. Introduction

Vestibular migraine is a common disease in otorhinolaryngology. It is characterized by frequent dizziness or vertigo, and may be accompanied by headache, nausea and vomiting. According to the survey results, the incidence of this disease is about 1% , mainly in middle-aged women, and the ratio of male to female is 1:5. The incidence of vestibular migraine is 10.0% ~ 22.0% in the population of migraine. At present, there is no effective drug for radical treatment. According to the Expert Consensus on the Diagnosis and Treatment of Vestibular Migraine (2018), it is recommended to use drugs that refer to migraine for the treatment of vestibular migraine. Stellate ganglion block has been established as a safe and effective treatment for migraine disorders. The stellate ganglion is the sympathetic ganglion, and betahistine hydrochloride is a histamine derivative that stimulates cerebral vasodilation and regulates cerebral blood circulation, which has a positive effect on relieving symptoms such as dizziness and headache . Ultrasound-guided stellate ganglion block is easier to perform than blind stellate ganglion block and has a higher probability of success. At present, whether stellate ganglion block can be used to treat recurrent symptoms of vestibular migraine in adults under the guidance of ultrasound has achieved some results. The aim of this study was to evaluate the efficacy of ultrasound-guided stellate ganglion block in combination with betahistine hydrochloride for the treatment and prevention of vestibular migraine in adults.

2. Data and Methods

2.1 General information

In this study, 100 patients with vestibular migraine were treated in our hospital from January 2022 to January 2024. Inclusion criteria: (1) All patients met the criteria of vestibular migraine through relevant examinations; (2) All patients had more than 5 episodes of severe vestibular symptoms lasting from 5 minutes to 72 hours; (3) a moderate to severe throbbing headache on one side at the onset of the disease,

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which is more severe during physical work; (4) a precise description of other vestibular or ICHD diagnostic criteria is not available. Exclusion criteria: (1) the patient was under 18 years of age; (2) the patient had serious heart, vascular, and pulmonary diseases; (3) the patient had a history of lidocaine allergy; (4) the patient was pregnant or lactating; (5) the patient was currently on anticoagulant therapy or had bleeding problems; (6) the patient had local skin infection and glaucoma. The patients were divided into experimental group and control group according to their different treatment intentions, with 50 patients in each group. In the control group, there were 30 males and 20 females, ranging in age from 22 to 83 years, with an average of (53.88 ± 4.29) years. There were 28 males and 22 females in the experimental group, ranging from 25 to 84 years old, with an average of (53.22 ± 7.58) years old. The gender and age of the two groups of patients were compared, and the difference was not statistically significant ($P > 0.05$), so they could be compared.

2.2 Method

(1) Patients in the control group were treated with betahistine hydrochloride. Take Betahistine Hydrochloride Oral Liquid (manufacturer: Zhejiang Kangenbei Pharmaceutical Co., Ltd., approval number: GYZZ H20013069), 10 ml each time, 3 times a day, for 10 days.

(2) The treatment plan of stellate ganglion block combined with betahistine hydrochloride was used in the experimental group. Stellate ganglion block was performed under ultrasound guidance. The patient was placed in the supine position and disinfected according to the standard. At the same time, patients are advised to turn their heads to the healthy side and open their mouths slightly. Under the guidance of ultrasound, the anterior tubercle of C6 transverse process and longus colli muscle were detected and located, and then the puncture operation was carried out so that the tip of the puncture needle touched the superficial layer of longus colli muscle and the lower part of prevertebral fascia. After complete aspiration without blood, 4 ml of 1% lidocaine was administered once daily for 10 days. The introduction of a positive Horner's syndrome is indicative of a successful stellate ganglion block.

2.3 Observation index

(1) Compare and observe the level of headache performance. The lower the score, the milder the symptoms of migraine. (2) The symptoms of vertigo were observed and evaluated by DHI index. The lower the score, the lighter the symptoms of vertigo. (3) Sleep quality was observed. PSQI index was used to evaluate and analyze, and the lower the score, the better the sleep quality. (4) To observe the continuous time of migraine and the effective rate. The continuous time of migraine was recorded, and the effective rate of treatment was divided into three criteria: control, significant effect and ineffective.

2.4 Statistical methods

All the data were analyzed and studied by using SPSS 25.0 statistical software tools. The measurement data were displayed by ($X \pm s$), and the inter-group test comparison was carried out by t. The count data were presented in (%), and the test comparison between groups was performed by x2. The difference between groups was statistically significant at $P < 0.05$.

3. Results

3.1 Compare the level of headache before and after treatment in the two groups

The NRS scores of the two groups were similar before treatment ($P > 0.05$). At the end of the treatment, the evaluation scores of NRS indexes in both groups were better than those before the treatment, and the evaluation scores of NRS indexes in the experimental group were lower than those in the control group ($P < 0.05$). See Table 1 for details.

Table 1: Comparison of headache performance levels before and after treatment in the two groups ($X \pm s$, points)

Group	Before treatment	After treatment	T-value	P value
Experimental group (n = 50)	4.17±1.39	1.60±1.04	10.192	0.000
Control group (n = 50)	4.39±1.41	2.95±1.04	6.191	0.000
T-value	-0.782	0.436		
P value	-6.601	0.000		

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3.2 Compare the vertigo symptoms of the two groups before and after treatment

Before treatment, the DHI scores of the two groups were similar (P > 0.05). At the end of treatment, the evaluation scores of DHI indexes in both groups were better than those before treatment, and the evaluation scores of DHI indexes in the experimental group were lower than those in the control group (P < 0.05), as shown in Table 2.

Table 2: Comparison of vertigo symptoms before and after treatment in the two groups (X ± s, points)

Group	Before treatment	After treatment	T-value	P value
Experimental group (n = 50)	45.91±14.64	15.67±5.78	11.561	0.000
Control group (n = 50)	43.00±13.42	17.72±8.96	14.127	0.000
T-value	1.058	0.429		
P value	1.415	0.160		

3.3 Compare the sleep quality of the two groups before and after treatment

The PSQI scores of the two groups were similar before treatment (P > 0.05). At the end of the treatment, the PSQI scores of the two groups were better than those before the treatment, and the PSQI scores of the experimental group were lower than those of the control group (P < 0.05), as shown in Table 3.

Table 3: Comparison of sleep quality between the two groups before and after treatment (X ± s, points)

Group	Before treatment	After treatment	T-value	P value
Experimental group (n = 50)	11.51±3.72	4.70±1.77	11.338	0.000
Control group (n = 50)	11.58±3.50	10.14±3.07	72.332	0.027
T-value	-0.096	-10.764		
P value	0.924	0.000		

3.4 Compare the continuous time of migraine occurrence and the effective rate between the two groups

The continuous time of migraine in the experimental group was shorter than that in the control group, and the effective rate of the experimental group was 92.00%, which was significantly higher than that of the control group (80%), as shown in Table 4.

Table 4: Comparison of continuous time of migraine and effective rate between the two groups (X ± s,%)

Group	Duration of migraine attack (H)	Effective rate of treatment			
		Control	Remarkable effect	Not valid	Total effective rate
Experimental group (n = 50)	2.99±5.29	25(50.00)	21(42.00)	4(8.00)	46(92.00)
Control group (n = 50)	8.39±14.65	18(36.00)	22(44.00)	10(20.00)	40(80.00)
T-value/x2-value	-2.400				2.429
P value	0.018				0.163)

4. Discussion

From the results of this study, it can be seen that stellate ganglion block and betahistine hydrochloride under ultrasound guidance are excellent in controlling pain, vertigo and sleep in patients with vestibular migraine, which is closely related to the morbidity principle of vestibular migraine.

The mechanism of ultrasound-guided stellate ganglion block in the treatment of patients with vestibular migraine is as follows: The mechanisms of vestibular migraine and migraine have many similarities, and many of the disease speculations about vestibular migraine are mainly derived from migraine studies . About 20% of patients with vestibular migraine will have typical migraine aura. People with chronic migraine may experience impairment of vestibular function, which may be associated with sensitization of the vestibular nucleus. Stellate ganglion block under ultrasound guidance can affect the spinal reflex pathway, reduce the sensitivity of sympathetic nerve, reduce local vasoconstriction, increase local blood velocity, promote the relief of ischemic and hypoxic symptoms of local organs, and reduce headache manifestations. The results of this study showed that the NRS scores of the two groups were similar before treatment (P > 0.05), and the NRS scores of the experimental group were lower than those

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of the control group after treatment ($P < 0.05$).

The mechanism of action of ultrasound-guided stellate ganglion block in the treatment of vertigo in patients with vestibular migraine is that the formation of vestibular migraine may be due to an abnormal response of the vestibular nerve and a thalamus in a shared anatomic pathway for pain transmission . Under the guidance of multiple ultrasound, stellate ganglion block can adjust the hypothalamus, promote the repair of the autonomic nervous system, activate the vagus nerve and sympathetic nerve in the stomach, thereby improving the blood supply of the stomach, enhancing its activity, reducing the nausea and vomiting of patients, and allowing the self-conscious nervous system to exercise effectively [8], so as to improve the vertigo of the patient. The results showed that the DHI scores of the two groups were similar before treatment ($P > 0.05$), and the DHI scores of the experimental group were lower than those of the control group after treatment ($P < 0.05$).

The mechanism of ultrasound-guided stellate ganglion block in improving the sleep quality of patients with vestibular migraine is that the frequent occurrence of vestibular migraine is often related to lack of sleep, and adequate rest and good sleep can effectively alleviate the symptoms of headache [9] . There is an interaction between sleep problems and migraines, which depends on common anatomical and biological principles. Effective prevention and treatment can significantly improve the quality of sleep. Treatment with ultrasound-guided stellate ganglion block improves sleep quality by increasing total sleep duration, reducing side effects, and reducing incubation period of sleep [10] . The data showed that the PSQI scores of the two groups were similar before treatment ($P > 0.05$). At the end of the treatment, the PSQI score of the experimental group was lower than that of the control group ($P < 0.05$). It is suggested that vestibular migraine helps to improve disease manifestations by improving sleep and can also prevent its recurrence. The continuous time of migraine in the experimental group was shorter than that in the control group, and the effective rate of the experimental group was 92.00%, which was significantly higher than that of the control group (80%). The results show that this treatment method has achieved good therapeutic effect.

5. Conclusions

To sum up, the combination of ultrasound-guided stellate ganglion block and betahistine hydrochloride is very effective in the treatment of adult vestibular migraine, which can effectively improve the symptoms of headache, dizziness, sleep problems and shorten the duration of the disease, so this method has the value of promotion.

References

[1] Stroke and Vertigo Branch of Chinese Stroke Association, Vertigo Committee of Neurologist Branch of Chinese Medical Doctor Association. Multidisciplinary Expert Consensus on Diagnosis and Treatment of Vestibular Migraine[J]. Chinese Journal of Internal Medicine, 2019, 58: 102-107.

[2] Chen Jianjun, He Lin, Yang Mei, et al. Research progress of stellate ganglion block and its mechanism [J]. II.Electronic Journal of Medical Literature, 2018,5: 192-193.

[3] Chen Yunfei, Wu Lifang, Wang Lihong, et al. Effect of stellate ganglion block on stress hormone levels in patients with cephalic and facial postherpetic neuralgia [J]. Journal of Difficult and Complicated Diseases, 2011, 10: 701-702.

[4] Yu Shengyuan, Wan Qi, Wang Wuqing, et al. Expert consensus on the diagnosis and treatment of vestibular migraine (2018) [J]. Chinese Journal of Pain Medicine, 2018,24: 481-488.

[5] Chen Xuejie, Ma Yanli, Wang Yanhong, et al. Correlation between the effect of stellate ganglion block on migraine and the change of regional cerebral oxygen saturation [J]. Henan Medical Research, 2019, 28: 3847-3850.

[6] Hao Yunxia, Cui Ligang. Clinical application of ultrasound-guided stellate ganglion block [J]. Chinese Journal of Medical Imaging, 2018,26: 308-311.

[7] Yang Shunli, Xu Hui. Clinical effect of betahistine mesylate combined with flunarizine hydrochloride in the treatment of vestibular migraine [J]. Clinical Medicine Research and Practice, 2022, 7: 56-58.

[8]] Li yuanyuan, Wang Ruo, Ru Sunxu, et al. Research progress on morbidity mechanism and treatment of vestibular migraine [J]. Anhui Medical Journal, 2022, 43: 237-240.

[9] Chen Jianjun, He Lin, Yang Mei, et al. Research progress of stellate ganglion block and its mechanism [J]. II.Electronic Journal of Medical Literature, 2018,5: 192-193.

[10] Zhang Yun, Dong Liang, Pan Qi, et al. Mechanism and treatment progress of migraine-related vertigo [J]. Chinese Journal of Modern Neurological Diseases, 2022, 22: 78-82.