Retraction Notice

The Editor-in-Chief and the publisher have retracted this article, which was submitted as part of a guest-edited special section. An investigation uncovered evidence of systematic manipulation of the publication process, including compromised peer review. The Editor and publisher no longer have confidence in the results and conclusions of the article.

CC, HH, JS, and SL either did not respond directly or could not be reached.

Therapeutic effect of immune trioxy autologous blood transfusion combined with ultrasound-guided paravertebral injection in postherpetic neuralgia treatment

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Abstract. We analyze the clinical efficacy of immune trioxy autotransfusion combined with ultrasound-guided paravertebral injection of trioxy in the treatment of postherpetic neuralgia (PHN). A total of 92 patients with thoracolumbar PHN treated in the pain department of our hospital from January 2020 to January 2022 were selected as the subjects of our study, and the patients who received conventional treatment were included in the conventional treatment group ($n = 46$). Patients who received visual communicator-based immunotrioxic autologous blood transfusion combined with ultrasound-guided paravertebral trioxic injection were included in the combined treatment group ($n = 46$). We observed the clinical efficacy, changes in pain degree, and quality of life of patients after treatment and obtained the following research results. The total effective rate of combined treatment group increased significantly compared to that of conventional treatment group ($P < 0.05$). The visual analog scale scores were significantly decreased after treatment, and the scores of the combined treatment group decreased significantly than those of the conventional treatment group (all $P < 0.05$). The brief pain inventory scores were significantly decreased after treatment, and the scores of the combined treatment group decreased significantly compared to the conventional treatment group (all $P < 0.05$). There is a significant correlation between the degree of pain and the quality of life. The above research results can prove that the combination of immune trioxy autologous blood transfusion based on visual communication device and ultrasound guided paravertebral injection of trioxy in the treatment of patients with thoracolumbal PHN has good clinical efficacy, which can help patients reduce pain and improve quality of life. Immune trioxy autologous blood transfusion combined with ultrasound-guided trioxy paravertebral injection based on visual communicator is worthy of clinical application. © *2023 SPIE and IS&T* [DOI: 10.1117/1.JEI.32.6.062602]

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1 Introduction

Herpes zoster (HZ) is mainly caused by viral reactivation of latent Varicella zoster virus (VZV) in the body under the condition of reduced immunity. Varicella (chickenpox) is an infectious disease with a high incidence. It is caused by the VZV, a DNA virus that belongs to the herpesvirus family. VZV remains in the body as a latent infection after the original infection (in the sensory nerve ganglia). Varicella is a primary infection with the VZV. The clinical manifestations are obvious rash and intense pain in the innervated area.[1] HZ or shingles is a unique condition caused by VZV reactivation. When immunity to VZV weakens due to age or immunosuppression, this reactivation takes place. Although it may affect people of any age, older people are most frequently affected with HZ. HZ patients in the acute phase are more likely to be

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complicated with ganglitis, and the blood supply in the nerves of the patients is significantly reduced compared with the normal state, which is likely to cause ischemic necrosis of the nerves.[2] Related studies have shown that some young patients can recover after 3 to 4 weeks of skin damage and pain symptoms, but there are still some patients with long-term persistent skin damage and strong pain, showing paroxysmal exacerbation, hyperalgesia, and abnormal pain. If timely and effective intervention measures are not given, patients are likely to develop postherpetic neuralgia (PHN).[3] PHN is the most frequent shingles symptom. Burning pain that persists long after the rash and blisters of shingles goes away is caused by the disorder, which damages skin and nerve fibers. Age affects the likelihood of developing PHN, which typically affects adults over 60. Although there is no cure, therapies can lessen the symptoms. PHN often gets better over time for most patients. shingles-related pain that persists three months or more after the rash has healed. The associated pain has been characterized as deep and burning, searing, or sharp and jabbing, responsiveness to mild touch individuals suffering from the disease frequently find it intolerable to simply touch clothes against the skin (allodynia). PHN often occurs in elderly patients, which seriously affects their normal life and leads to a decline in their quality of life. PHN is more common in elderly patients and is easy to cause PHN when human immunity is decreased, which seriously affects the quality of life of patients.[4] At present, the treatment of PHN is still mainly oral drugs, such as nonsteroidal anti-inflammatory analgesics, opioid narcotic analgesics, antiepileptic drugs, and antidepressants. Drug treatment has problems, such as slow effect, long course of treatment, and large adverse reactions. Therefore, finding a method to eliminate PHN more quickly and thoroughly has become a hot spot in current research. Trioxygen has strong oxidation, anti-inflammatory, and analgesic effects. Because it can block nerve nociceptive conduction, reduce the accumulation of local inflammatory substances, and improve microcirculation, it has been gradually applied to the treatment of HZ pain and PHN.[5] Nociception is the physiological mechanism through which human tissues are protected from disease. Nociceptors are stimulated by potentially noxious stimuli. The body's "fight or flight reaction" and its defense against damage from its surroundings depend on nociception. Literature has shown that there are reports of blind paravertebral injection of trioxy alone or immunotrioxy autologous blood transfusion for the treatment of PHN.[6] However, there is no research report on immune trioxic autologous blood transfusion combined with ultrasound-guided trioxic paravertebral injection in the treatment of PHN. The two most common treatments recommended for postherpetic neuralgia are gabapentin and pregabalin. Similar to the antidepressants prescribed for postherpetic neuralgia, their dosage should be progressively raised over the course of a few days or weeks. Additionally, they often need to be taken for a few weeks before they become effective. In addition, with the continuous development of imaging technology in the medical field, the means of medical visual information dissemination are more diverse. The communication of medical visual information not only refers to the use of color and line but also includes the use of light or perspective and other technical means to convey information, so as to obtain the optimal communication effect, such as medical imaging technology in the medical world[7] and modern medical imaging technology. Visual design is a journey to greatly expand the scope of human visualization. From the well-known traditional diagnostic images, such as electrocardiogram (ECG) and B-ultrasound to new high-tech digital images, such as nuclear magnetic resonance, three-dimensional image, and molecular image, medical image visualization design has expanded its single medical value development into a comprehensive system integrating medical value and aesthetic value. An ECG monitors the heart's electrical activity in order to detect various cardiac problems. Electrodes are positioned on the chest to capture the electrical impulses that drive heartbeat. The signals are exhibited as waves on a connected computer monitor or printer. B-scan ultrasonography (USG) is a straightforward, noninvasive method for identifying diseases of the eyeball's posterior region. With the use of this technique, common disorders, including cataract, vitreous degeneration, retinal detachment, ocular trauma, choroidal melanoma, and retinoblastoma, may be clinically diagnosed. Based on this, we observed the clinical efficacy of paraspinal trioxy injection in the treatment of PHN by immunotrioxy autologous blood transfusion combined with ultrasound-guided visual transmitter. The results are reported as follows.

2 Data and Methods

2.1 *General Information*

The study subjects were 92 individuals with thoracolumbar PHN who received care in our hospital's pain clinic between January 2020 and January 2022. The combination therapy group and the conventional treatment group were developed, with 46 patients in each group, in accordance with the various intervention techniques. Screening programs, immunization, food and water supplements, and health promotion are examples of common interventions. Obesity, drug, alcohol, and tobacco use, as well as the spread of infectious diseases, are typical problems that are the focus of treatments in public health. There were 21 men and 25 women in the combined therapy group, ranging in age from 60 to 78, with an average age of (70.39 + 5.39) years. The average length of the illness was 8.155.49 months, ranging from 1 to 17 months. There were 22 men and 24 women in the usual therapy group, ranging in age from 61 to 78 years, with an average age of (71.174.82) years. The average length of the illness was 8.544.94 months, ranging from 1 to 18 months. The baseline data, including gender, age, mean illness course, and site of disease, did not significantly vary between the two groups (all $P > 0.05$), demonstrating the validity of the comparison of the two groups.

Inclusion criteria. (1) All patients were ≥60 years old. (2) The clinical symptoms and related diagnostic results were in line with the diagnostic criteria of thoracolumbar PHN. Average pain levels in thoracolumbar PHN were somewhat higher than those in trigeminal PHN (visual analogue scale 5.0 versus 4.6). In contrast to PHN in the face, PHN in the thoracolumbar region was characterized by substantially more intense burning sensations, allodynia, and painful symptoms. (3) All patients received pain assessment scale [visual analog scale (VAS)] with a score of ≥5. (4) Patients could collaborate with this research to finish the pertinent inquiry up to the study's conclusion since they have high levels of clinical compliance and collaboration. *Exclusion standards*: Patients with the following conditions were excluded from the study: (1) those with severe hepatic and renal dysfunction; (2) those with coagulopathy; (3) those with hyperthyroidism and G-6-PD deficiency; (4) those who were allergic to the medications used; and (5) those with moderate-to-severe anemia; (6) blood and needle sickness history; and (7) patients complicated with mental illness and unable to cooperate with the completion of the study.

2.2 *Methods*

2.2.1 *Intervention methods in conventional treatment group*

Patients received pregabalin capsules (Lorica-Pregabalin capsules 150 mg × 8 capsules, Pfizer Pharmaceutical Co., Ltd.) orally: 150 mg/time, twice daily; amitriptyline hydrochloride tablets (25 mg × 100 tablets, Hunan Dongting Pharmaceutical Co., Ltd.) oral: 25 mg/time, once a day and should be taken before bed. Both drugs were appropriately increased or decreased according to the situation. Oral drugs were used for 10 days as a course of treatment, and two courses of treatment were used continuously.

2.2.2 *Intervention method of combined treatment group*

In the combined treatment group, on the basis of the treatment method of 1.2.1, visual communicator immunotrioxy autologous blood transfusion combined with ultrasound-guided paravertebral trioxy injection was given. Autologous blood transfusion is the process of reinfusing blood or blood components to the same individual from whom they were originally extracted. The collection and reinfusion of a patient's own blood or blood components is known as an autologous blood transfusion. Allogenic or homologous blood transfusions involve the collection and injection of a compatible donor's blood into the recipient. The specific steps were as follows. ① *Immunotrioxy autologous blood transfusion*. The medical staff maintained aseptic operation during the whole process and punctured the median cubital vein or your key vein with a 16 to 18 special intravenous induration needle. 100 ml of blood from PHN patients was taken through a special blood transfusion device and anticoagulant and antioxidant blood collection bag, and the

same amount of medical trioxygen gas was quickly added. Antioxidants are molecules that may protect cells from free radicals, which have been linked to cancer, heart disease, and other illnesses. Free radicals are molecules that the body generates as it breaks down food or when it is exposed to radiation or cigarette smoke. The concentration of trioxygen increased from 20, 25, 30, and 40. After 40 μg/ml, the concentration did not increase. The blood bag was shaken in the same direction for 3 to 5 min with an oscillator, thoroughly mixed and returned to the patient (once a day, 10 times for a course of treatment, a total of 2 courses). Medical trioxygen gas is prepared by German Carter ozone therapy devices basic instrument; ozone therapy produced by combining an electric discharge gradient on quartz glass with pure, elemental oxygen gas. It is supplied through medical-grade silicone tubing after being combined with the patient's own blood (similar to getting an IV). Ozone promotes healing by oxygenating the body. Burning eyes, coughing, dizziness, nausea, lightheadedness, or a moderate headache are typical side effects of ozone therapy. These symptoms are generally transient and decrease immediately after therapy. In ozone therapy, a Herxheimer (healing) reaction might occur. Trioxygen is a potent oxidant that is employed in chemical processes, the ozonization of water and oils, and a number of medical specializations. Medicinal uses of ozone, which developed in the 20th century, are particularly intriguing since they are the outcome of ozone's antimicrobial action. ② *Ultrasound-guided trioxygen paravertebral injection based on visual communicator*. In the special treatment of indoor operation, the immune three oxygen intravenous fluid retention after autologous blood doping treatment, monitoring of vital signs, prone or lateral position, orientation spines stage, marked block segment spine position, regular disinfection shop towels, ultrasonic probe with sterile gloves (in Mindray U portable color ultrasound diagnosis system). By delivering a complete image of the paravertebral region during needle manipulation, an ultrasound-guided method has the potential to reduce complications. Portable ultrasound equipment allows practitioners to go with them and scan patients wherever they are in real time. Without relying on the availability of a single machine, portable ultrasound equipment enables doctors to get high-quality images. The ultrasound probe scanned the affected side of the marked spines one by one, confirmed the transverse process to be punctured, and then translated slightly to the head end to confirm the paravertebral pleura and space. Ultrasound is more widely available, simple to use, and less costly than most other imaging techniques. Ultrasound imaging is completely radiation-free and extremely safe. Soft tissues that are difficult to see on x-ray images can be clearly shown through ultrasound scanning. Techniques using diagnostic USG are often painless. They do not require any injections, incisions, or needles. Patients do not have persistent pain after surgery or other postoperative problems as a result. For instance, a pregnant woman's belly can be probed to obtain a clear image of her unborn child. In the plane, the nerve block needle (Bellan Stimuplex A22G, 100 mm) was used to enter the paravertebral space from outside to inside, and the needle reached the paravertebral space. After the blood and air were withdrawn with an empty syringe, replace the taken air syringe and inject 8 to 10 ml of trioxygen at a concentration of 30 μg/ml. If the range of skin lesions was large, 2 to 3 adjacent paravertebral spaces could be selected for injection. Once every other day, 5 consecutive times as a course of treatment, 3 days after the next course of treatment, a total of 2 courses, vital signs were monitored for 2 h after injection.

2.3 *Observation Indicators*

(1) Compare the clinical efficacy before and after treatment;
(2) VAS scores before and after treatment were compared;
(3) compare the quality of life; and
(4) to analyze the correlation between pain degree and quality of life.

2.4 *Evaluation Criteria*

2.4.1 *VAS scale assessment*

The VAS is a recognized, subjective assessment for acute and chronic pain. On a 10-cm line that indicates a continuum between "no pain" and "worst sorrow," also, handwritten comments are

used to record scores. Use a 10-cm ruler, the left end from 0 is "no pain," the right end to 10 cm is "the most pain." The patient was asked to move the buoy to the location of his current pain. The tester read the distance from the "painless" end to the cursor. The length was the pain intensity score, which ranged from 0 to 10, and the pain severity increased as the score increased.[8]

2.4.2 *Clinical efficacy evaluation*

The evaluation criteria of nerve injury repair degree. Hyperalgesia is a condition that produces abnormally extreme pain in settings when feeling pain is normal but the pain is considerably more severe than it should be. This disorder develops as a result of disturbances or modifications in the way the nervous system handles pain. The disappearance of hyperalgesia (skin tenderness) and the return of skin temperature to normal were judged as excellent. Hyperalgesia (skin tenderness) was significantly reduced, and skin temperature was basically normal. Judge as good, hyperalgesia (skin tenderness) was more obvious and skin temperature did not improve significantly. No improvement in skin temperature and hyperalgesia (skin tenderness) compared with before treatment was considered ineffective. An intervention's ability to achieve the desired outcome under ideal conditions is assessed in randomized trials. The extent of a positive effect in "real-world" healthcare situations is measured through effectiveness trials. A clinical trial is frequently performed to determine whether a prospective treatment is more efficient than the current treatment and/or has lesser negative side effects. Total effective rate = (excellent + good)/total number of cases × 100%.

2.4.3 *Assessment of patients' quality of life*

The brief quality of life assessment scale [brief pain inventory (BPI)] was used. The BPI assesses the degree to which pain has interfered with seven daily activities, including general activity, walking, work, mood, enjoyment of life, interactions with others, and sleep. The QOLS is a viable tool for assessing quality of life across patient groups and cultures and is conceptually separate from health status or other causative markers of quality of life. The average of the seven items used to measure interference from BPI pain is generally used to calculate the score. The score ranges from 0 to 10, and the higher the score is, the worse the quality of life is.[9]

2.5 *Statistical Methods*

All data obtained in this study were included in SPSS26.0 for statistical analysis, in which measurement data were expressed as mean ± standard deviation and t-test was used. The major use of SPSS software is the quantitative analysis of complex data. IBM SPSS Statistics Version 26 includes the new statistical tests, updates to current statistics and scripting techniques, and new production facility functionalities. A statistical test called a t-test is used to compare the means of two groups. To determine if a technique or therapy significantly impacts the population of interest or whether two groups change from one another, it is widely used in hypothesis testing. Enumeration data were expressed as (n, %), and x_2 test was used. Pearson correlation coefficient analysis was used to analyze the relationship between VAS score and quality of life, and $P < 0.05$ confirmed statistical difference. A test statistic called Pearson's correlation coefficient is used to establish a statistical linkage between two continuous variables. It is considered as the finest method to quantify the connection between variables of interest because it is based on the concept of covariance.

3 Results

3.1 *Compare the Clinical Efficacy Before and After Treatment*

The total clinical effective rate of the combined treatment group increased significantly than that of the conventional treatment group ($P < 0.05$), as shown in Table 1.

Table 1 Comparison of clinical efficacy before and after treatment (n, %).

Group	Optimal	Good	Poor	Invalid	Total effective rate
Combined treatment group ($n = 46$)	28(60.87)	12(26.09)	4(8.70)	2(4.35)	40(86.96)
Conventional treatment group ($n = 46$)	12(26.09)	19(41.30)	10(21.74)	5(10.87)	31(67.39)
x_2	—	—	—	—	4.998
P	—	—	—	—	0.025

Table 2 Comparison of VAS scores before and after treatment.

Group	Before the treatment	After the treatment
Combined treatment group ($n = 46$)	7.15 ± 0.79	2.71 ± 0.84*
Conventional treatment group ($n = 46$)	7.04 ± 0.84	3.87 ± 0.83*
t	0.647	6.662
P	0.519	<0.001

Note: *$P < 0.05$ compared with before treatment.

3.2 *Compare the Pain Degree Before and After Treatment*

There was no significant difference in VAS scores before treatment ($P > 0.05$). Chronic pain may restrict regular activities and make working complicated. As a consequence, users' relationships with their friends and family could change. Coworkers, family, and friends may need to perform more labor than normal when people are unable to complete the things, they usually complete. Users may feel socially isolated from others around. VAS scores of the two groups were significantly decreased after treatment, and the scores of the combined treatment group decreased significantly than those of the conventional treatment group (all $P < 0.05$), as shown in Table 2.

3.3 *Compare the Quality of Life*

Before treatment, there was no appreciable change in BPI scores between the two groups ($P > 0.05$). As demonstrated in Table 3, the BPI scores considerably declined after therapy, with the combination treatment group seeing a greater decline than the conventional treatment group (all $P < 0.05$).

Table 3 Comparison of quality of life before and after treatment.

Group	Before the treatment	After the treatment
Combined treatment group ($n = 46$)	7.54 ± 1.07	1.96 ± 0.89*
Conventional treatment group ($n = 46$)	7.72 ± 1.19	4.13 ± 0.86*
t	0.763	11.892
P	0.448	<0.001

Note: * $P < 0.05$ compared with before treatment.

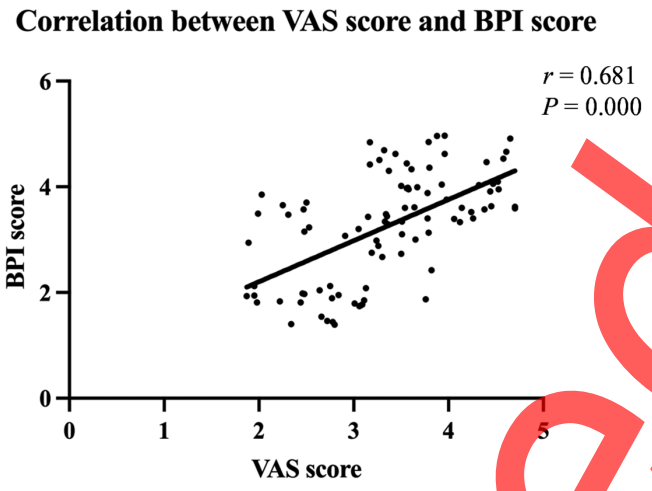

Fig. 1 Correlation between VAS score and BPI score.

3.4 *Analyze the Correlation Between Patients' Pain and Quality of Life*

The Pearson correlation method is the method that is most often used for numerical variables. It produces a number between 0 and 1, where 0 denotes no link, +1 denotes the full positive correlation, and −1 denotes the entire negative correlation. The two main drawbacks of Pearson's R are that it cannot identify nonlinear correlations between variables and that it cannot distinguish between dependent and independent variables. Pearson correlation coefficient analysis showed that VAS score was significantly positively correlated with BPI score ($P < 0.05$), as shown in Fig. 1.

4 Discussion

The pain caused by PHN is neuropathic, which is prone to occur in elderly patients. Relevant research data show that the incidence of PHN in elderly people more than 60 years old can reach 50%.[10,11] It should be noted that at present, the pathogenesis of PHN is still to be clarified, and the clinical treatment of this disease is relatively diverse. However, the improvement effect of traditional drug treatment in patients with PHN is difficult to reach the expectation, so exploring new safe and effective treatment methods for PHN has always been the goal of clinicians.[12]

In the previous studies, simple trioxy autologous blood transfusion therapy and blind puncture alone were used for paraspinal trioxy injection therapy in patients with PHN, but blind puncture brings great difficulty to the accurate operation of clinicians.[13] Blind puncture access methods are used in medicine, but they might cause difficulties related to over-puncture. Device suddenly accelerates inside patient when tissue membranes give way under given tension. Blood lost after surgery or an injury is replaced by blood transfusions, which has the potential to save lives. A blood transfusion may also be used to treat patients who are suffering from disorders that make it difficult for their body to normally produce enough blood cells. People who suffer from diseases, such as leukemia or renal failure, both of which may cause anemia, regularly get blood transfusions. On the basis of the above treatment protocol, this study optimized and improved the paravertebral trioxygen injection with ultrasound guidance based on visual communication device, which brought positive effect on improving the accuracy of paravertebral puncture for clinicians. At the same time, the use of medical trioxy autologous blood transfusion combined with ultrasond-guided paravertebral trioxy injection in the treatment of PHN can also effectively make up for the shortcomings of single treatment regimen. This study results show that the combined treatment of PHN patients clinical improvement effect is more significant, patients after treatment significantly less pain and quality of life level increased significantly, confirmed the immune three oxygen based on visual communication apparatus of autologous blood doping jointly by the three oxygen vertebral injection guided by ultrasound therapy for the treatment of PHN effect is superior to pure oral medication.

At present, there are many clinical treatment methods for PHN, but there are few related reports on PHN treatment using the method of this study. Previous studies have applied immunotrioxic autologous blood transfusion therapy in the treatment of viral hepatitis, rheumatic diseases, hyperlipidemia, insomnia and subhealth, and obtained obvious curative effects.[14]

Trioxygen has a strong oxidation, can kill bacteria, viruses, and easy to spread. The treatment of immune trioxygen autotransfusion can activate red blood cells, increase the oxygen carrying capacity of red blood cells and the ability to release oxygen, and promote the healing of skin lesions and nerve repair by increasing the oxygen supply of skin and nerve endings, intercostal nerves of skin lesions, dorsal root ganglia, and dorsal horn of spinal cord. Taking advantage of the characteristics of trioxygen, which is easily soluble in water at room temperature, paraspinal injection of trioxygen can directly increase the oxygen supply of the damaged nerve root, help to eliminate the pain-causing factors around the spinal nerve root, dorsal root ganglia and sympathetic ganglia, reduce the edema of the spinal nerve root, and promote the repair of the injured nervous system.[15,16] Studies have shown that trioxygen can also mediate the production and release of nitric oxide by vascular endothelial cells to produce analgesic effects at the spinal cord level.[17] After three oxygen is combined with blood, hydrogen peroxide is produced. This chemical reaction triggers a series of chemical reactions that cause the body to produce interleukins, interferon, and other cytokines, which play a role in activating and regulating the immune system[18] and restoring the thalamus's normal control over pain loops. The treatment of medical trioxygen autologous blood transfusion can produce a sense of euphoria, relieve the fatigue and depression of patients, and further increase their physical strength, stabilize their mental state and enhance their memory.[19] At present, blind paraspinal puncture is mostly used in clinical treatment, which has certain risks, such as pneumothorax caused by piercing the pleura, strayed into the subarachnoid space and neurovascular injury. The application of paravertebral trioxygen injection under the guidance of ultrasound based on visual communicator can minimize and avoid the occurrence of adverse reactions and complications.[20] Trioxygen has anti-inflammatory and analgesic effects, which can block the transmission of pain signals, improve microcirculation, and reduce the accumulation of local inflammatory substances in nerve roots.[21] After being injected into the paravertebral space, trioxygen can be evenly and fully dispersed around nerve roots, so that the nerve can be separated from the surrounding inflammatory tissue and achieve a more adequate therapeutic effect.[22] In addition, through in-depth analysis, this study found that the pain degree of PHN patients has a great impact on the quality of life, so it is necessary to pay close attention to the changes of pain in PHN patients and timely adjust the diagnosis and treatment plan, which can bring positive effects on improving the prognosis and quality of life of patients.[23]

5 Conclusion

Immune trioxy autologous blood transfusion based on visual communicator combined with ultrasond-guided paravertebral injection of trioxy in the treatment of patients with thoracolumbral PHN has good clinical efficacy, which can help patients reduce pain and improve quality of life. Immune trioxy autologous blood transfusion combined with ultrasound-guided trioxy paravertebral injection based on visual communicator is worthy of clinical application.

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Data Availability Statement

The data used to support the findings of this study are available from the corresponding author upon request.

References

1. Q. S. Meng et al., "Clinical application of ultrasound guided erector spinae plane block in thoracoscopic surgery," *Chin. J. Prev. Med.* **25**(10), 786–788 (2019).
2. L. K. Chen et al., "Looking back to move forward: a twenty-year audit of herpes zoster in Asia-Pacific," *BMC Infect. Dis.* **17**(1), 213 (2017).
3. K. V. Chang et al., "Sonographic tracking of trunk nerves: essential for ultrasound-guided pain management and research," *J. Pain Res.* **10**(1), 79–88 (2017).
4. L. L. Gu et al., "Clinical study of gabapentin combined with intradermal block in the treatment of senile postherpetic neuralgia," *Chin. J. Pain Med.* **23**(9), 696–698 (2017).
5. J. S. Saran et al., "Comparison of single-injection ultrasound-guided approach versus multilevel landmark-based approach for thoracic paravertebral blockade for breast tumor resection: a retrospective analysis at a tertiary care teaching institution," *J. Pain Res.* **10**(1), 1487–1492 (2017).
6. K. Wang, H. P. Jia, and Y. J. Ren, "Effect of paravertebral nerve block combined with intradermal block on postherpetic neuralgia," *Chin. J. Pain Med.* **23**(11), 868–871 (2017).
7. S. Krishnamoorthy et al., "Regression model-based feature filtering for improving hemorrhage detection accuracy in diabetic retinopathy treatment," *Int. J. Uncertain. Fuzziness Knowledge-Based Syst.* **29**(Supp 1), 51–71 (2021).
8. C. D. Moulton et al., "The Maudsley 3-item Visual Analogue Scale (M3VAS): validation of a scale measuring core symptoms of depression," *J. Affect. Disord.* **282**, 280–283 (2020).
9. V. Kuosmanen et al., "Brief pain inventory (BPI) health survey after midline laparotomy with the rectus sheath block (RSB) analgesia: a randomised trial of patients with cancer and benign disease," *Anticancer Res.* **39**(12), 6751–6757 (2019).
10. R. R. Dayan and R. Peleg, "Herpes zoster-typical and atypical presentations," *Postgrad. Med.* **129**(6), 567 (2017).
11. J. Ni et al., "Subcutaneous injection of triamcinolone and lidocaine to prevent postherpetic neuralgia," *Pain Phys.* **20**(5), 397–403 (2017).
12. K. Yue, S. X. Yu, and X. W. Lin, "Postherpetic neuralgia and herpes zoster syndrome," *J. Qiqihar Med. Coll.* **39**(15), 1822–1824 (2018).
13. J. R. Xia and Z. J. Du, "Clinical study of pregabalin combined with ultrasound-guided paravertebral nerve block in treatment of postherpetic neuralgia," *Chin. J. Med. Doctors* **19**(10), 1570–1572 (2017).
14. R. Wang et al., "Treatment of herpes zoster complicated with facial nerve palsy: a case report," *Chin. J. Pain Med.* **27**(7), 556–558 (2021).
15. O. Pusterla, G. Bauman, and O. Bieri, "Three-dimensional oxygen-enhanced MRI of the human lung at 1.5T with ultra-fast balanced steady-state free precession," *Mag. Resonan. Med.* **79**(1), 246–255 (2018).
16. C. J. Law et al., "Three-dimensional kinematic reconstruction of the optically-emitting, high-velocity, oxygen-rich ejecta of supernova remnant N132D," *Astrophys. J.* **894**(1), 73 (2020).
17. F. Zhao et al., "Evaluation of pulmonary ventilation in COVID-19 patients using oxygen-enhanced three-dimensional ultrashort echo time magnetic resonance imaging: a preliminary study," *Clin. Radiol.* **76**(5), 391.e33–391.e41 (2021).
18. Q. Guo et al., "Efficacy and safety of continuous paravertebral block combined with ozone injection in the treatment of herpes zoster neuralgia in elderly patients," *Pract. Geriatr. Med.* **31**(7), 620–622 (2017).
19. L. Hua, Z. H. Ou, and J. M. Zhao, "Effect of ozonated autoblood combined with nerve block therapy on postherpetic neuralgia," *Sichuan Med.* **39**(5), 555–558 (2018).
20. T. Lin and Y. E. Dai, "Clinical efficacy of ozone autotransfusion in the treatment of postherpetic neuralgia and its effect on serum IL-6 TNF-α," *Hebei Med.* **25**(2), 238–240 (2019).
21. S. O. Salihu and Z. Iyya, "Assessment of physicochemical parameters and organochlorine pesticide residues in selected vegetable farmlands soil in Zamfara State, Nigeria," *Sci. Prog. Res.* **2**(2), 559–566 (2022).

22. A. Shahabaz and M. Afzal, "Implementation of high dose rate brachytherapy in cancer treatment," *Sci. Prog. Res.* **1**(3), 77–106 (2021).
23. B. Ahmed and A. Ali, "Usage of traditional Chinese medicine, western medicine and integrated Chinese-western medicine for the treatment of allergic rhinitis," *Off. J. Zhende Res. Group* **1**(1), 1–9 (2020).

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