

RESEARCH ON CLINICAL MANIFESTATIONS, CORRELATIVE FACTORS AND EVALUATING THE RESULTS OF TOPICAL TREATMENT OF ZONA WITH HE-NE LASER COMBINATION AT CAN THO DERMATO-VENEREOLOGY HOSPITAL IN 2021

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ABSTRACT

Background: Shingles is a common skin infection, caused by the latent Varicella zoster virus in the paraspinal cranial nerve ganglia, when there are favorable factors such as immunosuppression makes the virus active again. The disease greatly affects the patient's quality of life. **Objectives:** Survey to determine clinical manifestations, correlative factors and evaluate the results of topical treatment of herpes zoster with He-Ne laser combination at Can Tho Dermato-Venereology Hospital in 2021. **Methods:** Cross-sectional descriptive study with 75 Zona patients who were treated according to the usual regimen and combined with local He-Ne laser at Can Tho Dermato-Venereology Hospital. **Results:** The disease that occurs in the age group over 60 years old is the most common (56%). Pain was found in 100% of patients. The vesicle lesions accounted for the highest rate (84%), the most commonly affected area was trunk 38.7%. Mild level accounted for 57.3%. The group of patients with more than 5 days of illness had a longer hospital stay (42.9%). After treatment with He-Ne laser, 66.7% had good treatment results. **Conclusions:** Herpes zoster disease occurs at any age, but mainly in the elderly with vesicles and pain in most of the patients, commonly on the trunk and head-face-neck area. Attention should be paid to the time before admission, the state of co-infection because they reduce the response to treatment. The combination of He-Ne laser with conventional regimens helped to cure and effectively reduce pain in Herpes Zoster patients.

Keywords: Herpes Zoster, VZV, Laser He-Ne.

I. INTRODUCTION

Shingles is a common skin infection, caused by the latent Varicella zoster virus (VZV) in the paraspinal or cranial nerve ganglia. It may activate under some favorable factors such as physical fatigue, immunodeficiency, etc. The most common symptom is persistent pain. The cause of neuropathic pain is the loss of axonal myelin sheath, causing severe damage and neurological symptoms. Lesions are stretchy, clustered vesicles on an erythematous background along with the distribution of peripheral nerves, usually localized to one side of the body [3], [7]. The disease is self-limited, but it can cause complications on the skin, eyes, nervous system. Shingles occurs everywhere, in all ages, especially patients over 50 years old [14]. Currently, there are many treatment methods for shingles such as antiviral drugs, immunomodulatory drugs, nerve blocks, corticosteroid therapy, and pain relief such as tricyclic antidepressants, intradural and epidural injections [1], [7]. In particular, the He-ne laser is a combination treatment that has the effect of accelerating wound healing, anti-inflammatory, and pain relief for shingles patients. Due to the relatively high incidence of the disease, affecting the patient's quality of life, gaining experience in clinical practice as well as treatment to make an accurate diagnosis and choose the best treatment for each patient are very necessary. Therefore, we conducted the study to determine:

1. Describe clinical manifestations and correlative factors of shingles at Can Tho Dermato-Venereology Hospital in 2021.

2. Evaluate the treatment results of Shingles in combination with He-ne laser at Can Tho Dermato-Venereology Hospital in 2021.

II. MATERIALS AND METHODS

2.1. Study population and setting

All patients were diagnosed with shingles and treated in the inpatient department of Can Tho Dermato-Venereology Hospital in 2021.

2.1.1. Standards for selection

Patients were clinically diagnosed as Herpes zoster and treated with a combination of He-Ne laser at Can Tho Dermato-Venereology Hospital. Diagnostic criteria:

- Signs: vesicles, pustules growing in clusters on an erythematous background, arranged in the path of a damaged nerve supply, on one side of the body.

- Symptoms: pain, burning, itching, fever.

2.1.2. Standards for elimination

Mental illness, pregnancy or lactation, neoplasms and malignancies.

2.2. Study design

- A cross-sectional descriptive study

- Sampling methods: convenience sampling

- Sample size: the sample size is calculated with the following equation

$$n = \frac{Z_{1-\frac{\alpha}{2}}^2 p(1-p)}{d^2}$$

In which: n: is the smallest sample size; Z = 95% ; $Z_{1-\alpha/2} = 1.96$

p: the healing rate after combined treatment with He-ne laser. According to Nguyen Quy Thai (2009) was of 81.7%, choose $p = 0.817$ [13].

d: is the tolerance allowed in the study 0.09.

Thus $n = 71$. The estimated sample size is 71 patients.

2.3. Study contents

Study general features such as age, and gender. Clinical features of shingles: age of onset, duration of disease, functional symptoms, current lesion location, clinical form, the severity of disease, and pain level according to Likert. Treatment results: level of response, remaining lesions upon discharge, pain level, treatment response, according to the number of He-Ne laser exposures.

2.4. Statistical analysis

Analyzing data with SPSS 20.0. To compare 2 or more rates, we use Chi-squared or Fisher's test, $p < 0.05$ is considered to be statistically significant.

2.5. Ethics Approval

All patients signed an informed consent before participating in the study. Patients had the right to refuse to participate in the study without affecting the quality of examination and/or treatment. Data collection sheets, and files were stored carefully. The study only had research purposes and no harmful effects on participants. Patient information was encrypted and kept confidentially.

III. RESULTS

Table 1. The distribution of age

Age	n	%
<60	33	44%
≥ 60	42	56%
Total	75	100%

The age group with the highest proportion was over 60 years old (56%).

Table 2. Lesions on admission

Lesions at admission	Yes		No		Total	
	n	%	n	%	n	%
Vesicle	63	84	12	16	75	100%
Bulla	37	49.3	38	40.7		
Erosion	48	64	27	36		
Pustule	17	22.7	58	77.3		

Vesicles were found in the the majority of patients, accounting for 63%, followed by skin erosions and blisters, while pustules accounted for the lowest with 22.7%.

Table 3. Injury distribution on admission

Injury distribution	n	%
Head, face, neck	25	33.3
Trunk	29	38.7
Hands and feet	7	9.3
Others	14	18.7
Total	75	100

Most lesions occurred in the head, face, neck, and trunk, accounting for 33.3% and 38.7%, respectively.

Table 4. Pain level on admission

Pain level	n	%
Mild	10	13.3
Moderate	37	49.3
Severe	28	37.3
Total	75	100

Most of the patients admitted to the hospital were at a moderate level (49.3%) and the lowest with severe level (37.3%).

Table 5. The relationship between the number of days in the hospital and the number of days before admission

The number of days	The number of days in the hospital				Total		Chi-square
	< 7 days		≥ 7 days		n	%	
	n	%	n	%			P= 0.014
< 5 days	46	85.2%	8	14.8%	54	100	
≥ 5 days	12	57.1%	9	42.9%	21	100	
Total					75	100	

The group of patients admitted to the hospital <5 days after the lesion was detected had a shorter hospital stay than the group of patients who were admitted to the hospital late after 5 days. This difference is statistically significant (p<0.05).

Table 6. Relationship between disease severity and age

Age	Severity of the disease				Total		Chi-square
	Mild		Moderate-severe		n	%	
	n	%	n	%			P= 0.001
<60	26	78.8	7	21.2	33	100	
≥60	17	40.5	25	59.5	42	100	
Total					75	100	

The older the group of patients, the more severe the disease is compared to the younger group. The difference was statistically significant with p<0.05.

Table 7. Distribution of pain levels after combined laser treatment of He-ne

Pain levels	Frequency (n)	Percentage (%)
Mild	63	84
Moderate	12	16
Severe	0	0
Total	75	100

Most of patients discharged from the hospital with mild pain (84%)

Table 8. Results of treatment with He-ne laser combination

Results of treatment	Frequency (n)	Percentage (%)
Excellent	50	66.7
Good	23	30.7
Moderate	1	1.3
Poor	1	1.3
Total	75	100

After the treatment process, patients had excellent treatment results accounted for 66.7%, and patients had good results accounted for 30.7%.

Table 9. The relationship between the number of irradiation and treatment results

Times	Treatment results				Total	Chi-square
	Excellent	Good	Moderate	Poor		
<7 times	34 (58.6%)	22 (37.9%)	1 (1.7%)	1 (1.7%)	58 (100%)	P=0.022
≥ 7 times	16 (94.1%)	1 (5.9%)	0	0	17 (100%)	
Total					75	

Regarding patients with less than 7 screenings, the level of good response accounted for 58.6%, lower than that of patients with the number of screenings ≥ 7 times (94.1%), with statistical significance ($p < 0.05$).

IV. DISCUSSION

- Age: In our study, there were no patients younger than 17 years old, and the disease occurred mainly in patients ≥ 60 years old, accounting for 56%. The results are similar to the study of Dang Van Em [11] with the percentage of elderly people (>70) predominating (68.33%), and the study of author Nguyen Thi Thu Hoai (2011) with the proportion of patients over 50 years old at 70.41% [12]. In Yu Hong's study [4], [6] the age group from 61-80 years old accounted for the highest rate (43.57%). The virus persists in the dorsal horn nodes of the spinal cord. They are not able to spread disease possibly due to the body's resistance in which is the main role of the cell-mediated immune system. With older age, the cell-mediated immune system becomes less effective, creating favorable conditions for the virus to reactivate. They move along nerve axons to the skin and cause shingles.

- Lesions: Multiple skin lesions may present in the same patient. In our study, the most common symptoms were pain and vesicle. At the time of admission, most patients had vesicle or bulla. The patient hospitalized late after the onset of symptoms had severe pustular superinfection. These symptoms are consistent with the study of the authors Tran Van Tien and Vu Huy Luong (2011) [15] which the most common lesions were vesicles in 64.33%, and burning pain appeared in most of the patients.

- Location: In our study, the majority of lesions occurred in the head, face, neck, and trunk, accounting for 33.3% and 38.7% respectively. The result is similar to the study of author Nguyen Quy Thai [13] which the proportion of lesions in the chest-arm and head, face neck accounted for 70%. The most common location is on the trunk (38.1%), followed by the head, face and neck (33.6%), followed by hands (5.3%), legs (4.4%). According to Tran Van Tien (2011), the distribution of lesions in the face area accounted for 53.3%, accounting for the majority of patients [15]. Because Can Tho Dermato-Venereology Hospital is the main treatment center for dermatological diseases in the Mekong Delta, most of the cases with moderate and severe clinical manifestations with high risk of regional complications such as eyes or face will be examined here, while many mild cases in places such as limbs are treated at the lower level.

- Degree of pain: Pain from shingles can appear before, during or after skin lesions. Pain can be localized but can also spread to nearby areas. In our study, all shingles patients at the time of admission had pain symptoms with the highest rate of moderate pain (49.3%), followed by severe pain (37.3%) and mild pain (13.3%). Meanwhile, the author Nguyen

Quy Thai recorded that the highest rate in the group of severe pain, painless patients, and mild, moderate and severe pain levels accounted for a relatively equal proportion, with 0%, 24.2%, 36.4% and 39.4% respectively. The research results are in the reports of other authors: Paudel. Vikash, Van Oorschot. D, Dang Van Em, and Vu Ngoc Vuong, are also similar to Nguyen Quy Thai [9], [10], [13]. This difference may be due to the difference in the distribution of age groups in the study and the duration of disease onset to hospital admission. Furthermore, pain sensation is a subjective sensation of the patient, and the pain threshold is also different for each individual. Thereby proving that the painful symptom is very common in shingles and a matter of great attention in the treatment process.

- Level of pain relief after He-ne laser treatment: All patients had pain symptoms at the time of hospital discharge. However, the difference in the time of admission is that no patients had severe pain; the number of patients with mild pain accounted for 84%. Pain is a symptom that persists and may persist in patients with shingles after treatment. The level of pain relief in our study is consistent with the study of author Feng et al, De Pedro. M [5]. This shows that the He-ne laser combined with the drug provides better results. It is not only in the treatment of herpes zoster but also in controlling the pain level of the disease.

- Results after He-Ne laser treatment: Patients had excellent treatment results with the rate of 66.7%, which is the highest among the groups of treatment results, followed by the group of patients with good treatment results (30.7%), and the lowest rate of 1.3% of the patient group with poor treatment results. In the study of author Nguyen Quy Thai (2009) [13], the results were similar to the rates of our study. Patients with excellent, good, moderate and poor treatment results were 81.8%, 15.2%, 3% and 0% respectively. In particular, there were no patients with poor treatment results. The cause of this difference is due to the different characteristics of the study subjects, especially the treatment before admission and the time of illness before admission. The patients in the group with poor treatment results belonged to the group of patients who voluntarily asked to be discharged from the hospital early, so the treatment results at the time of discharge were not different from the time of admission. The results of our study are similar to the study of author Li Hai Yan [8] with an excellent response rate of 92.16% of patients. The use of comprehensive laser Hene in recurrent HSV infections is more efficient than the use of medication therapy only. This approach offers the direct positive effect of the achievement of stable remission of the infectious disease in 95% of pregnant women, the increase of the immunoregulatory index by an average of 1.5 times compared to baseline values, clinical recovery acceleration (by 3.4 ± 1.1 days), and the prevention of recurrence [2].

- The relationship between the severity of the disease and age: our study showed that the group of patients <60 years old with moderate-severe disease accounted for 21.2%, while the group of patients ≥ 60 years old had a moderate level of disease. Moderate-severe disease accounted for 59.5%, this difference was statistically significant. Thereby showing that the older the patient is related to the severity of the disease due to the immunodeficiency. The study results are consistent with Bui Thi Van (2013) [16] with the proportion of patients over 70 years of age with moderate-severe disease accounting for about 97.9%.

- The relationship between the number of irradiation and treatment results: patients receiving He-ne laser more than 7 times had better treatment results (statistical significance

$p < 0.05$) than those receiving 7 laser treatments. Specifically, in the group of patients with the number of He-ne laser irradiations < 7 times, the proportion of patients with excellent, good, moderate and poor was 58.6%, 37.9%, 1.7% and 1.7% respectively. In the group of patients with He-ne laser irradiation ≥ 7 times, the percentages of patients with good, fair and average treatment results were 94.1%, 5.9%, and 0% respectively. In particular, in the group of patients with the number of He-ne laser irradiations ≥ 7 times, no patient had moderate or poor treatment results. This is reasonable in our opinion, because the mechanism of action of He-Ne laser reduces edema markedly, relieves pain, helps to increase circulation, nutrition, and early changes at the molecular and cellular level, as well as participates in the regulation of specific and non-specific immune systems. Thus, the combination of He-ne laser irradiation in parallel with the conventional treatment regimen is highly beneficial.

V. CONCLUSION

Shingles occurs at any age, usually over 60 (56%). The older the patients are, the more severe the disease, accounting for 59.5%. Soreness and blisters are the 2 symptoms with the highest rate at 100% and 84% respectively. The most common lesion site is trunk (38.7%), and head-face-neck (33.3%). Pain symptoms were found in 100% of study patients, with mainly moderate pain. In the study, 84% of patients had reduced pain to a mild level after He-ne laser treatment. No patients had severe pain when they were discharged from the hospital. Most patients had excellent treatment results when combining He-ne laser.

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