

Efficacy of He-Ne Laser in Combination with Topical Clindamycin in the Treatment of Acne Vulgaris (AV)

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Abstract

Objective: To evaluate the efficacy of He-Ne laser in combination with topical clindamycin in the treatment of AV at 108 Military Central Hospital from Oct 2015 to Aug 2016. **Subjects and Methods:** 61 patients with AV were divided into 2 groups: Group 1: 31 patients were treated with He-Ne laser in combination with topical Clindamycin, Group 2: 30 patients were only treated with topical clindamycin. Laser HE-NE was applied 2 times/week for 6 weeks. **Result:** After 3 months of treatment Group 1: very good—51.6%, good—48.4%. Group 2: very good—30%, good—50% and moderate—20%. **Conclusion:** The combination of He-Ne laser with topical clindamycin shows more rapid clinical improvement compared to topical clindamycin alone in the treatment of mild and moderate AV.

Keywords

Acne Vulgaris, He-Ne Laser, Clindamycin

1. Introduction

Acne vulgaris is a very common skin disease in both men and women with about 80% of adults. Especially, it most often affects adolescents from 13 to 25 years old [1] [2]. The pathogenic factors of AV hyperkeratosis might include infra-infundibulum, sebaceous duct, hyperactivity of sebaceous gland, hyperseborrhea, hyperproliferation of *P. acnes*, inflammation and immunological host reaction. In addition, factors such as family factors, psychological impact, environment, diet, personal hygiene also greatly affect the incidence of acne [3].

Clinical symptoms vary depending on the inflammation grades, increasing secretion and stagnation in sebaceous gland [4]. Most acnes do not cause serious complications, but the disease appearing mainly on the face would affect the aesthetic, psychology, confidence in communication, which deeply affects the patients' quality of life.

Helium-Neon laser (He-Ne) is a low-energy laser used in clinical practice. The main effect of He-Ne laser is biological stimulation, enhancing organization, increasing metabolism, increasing microcirculation in the tissues, increasing protein synthesis and activating the immune system [2] [5]. Clindamycin is an antibiotic used in acne treatment.

Therefore, this study was conducted with the objective to evaluate the efficacy of He-Ne laser combined with topical clindamycin in the treatment of acne vulgaris.

2. Subjects and Methods

61 patients with mild to moderate acnes AV were selected from the Department of Dermato-venereology and Allergy of 108 Central Military Hospital from Oct 2015 to Aug 2016.

Inclusion criteria: Patients with mild and moderate acne vulgaris.

Exclusion criteria: Age < 12 years, pregnancy, lactation, clindamycin allergy, light sensitivity. All patients were provided written informed consent.

This is a randomized, comparative and prospective study. 61 patients with acne vulgaris were divided into 2 groups: Group 1: 31 patients—He-Ne laser and topical clindamycin 1%, Group 2: 30 patients—topical clindamycin simple. Laser He-Ne was applied 2 times/week for 6 weeks.

The measurement of the acne treatment results was based on the percentage reduction of total lesions, with 4 levels: Very good: comedones, papules decreased $\geq 75\%$, pustules cleared; Good: comedones, papules decreased 50—<75%, pustules cleared; Moderate: comedones, papules decreased 25—<50%, pustules decreased; Poor: comedones, papules decreased <25%, pustules remained [3]. We photographed our patients at each time they visited and make a comparison between 4 timelines: at the beginning, after 1, 2, 3 months by counting the lesions.

The study was approved by The Board of Ethics in 108 Central Military Hospital at Ha Noi.

Data was analyzed by using SPSS software statistical computer package version 16. For quantitative data Student's t-test was used and the means and standard deviation were calculated. P value less than 0.05 was considered significant.

3. Results

In this study, we recorded the demographic characteristics, clinical symptoms and the measurement of lesions of participating patients in the following **Tables 1-4**.

Table 1. Demographics and clinical characteristics of studied samples.

Variable	HENE + Clindamycin	Clindamycin	p
Age (year)	22.6 ± 4.8	21.7 ± 5.1	>0.05
Sex	Male	4	>0.05
	Female	27	
Severity	Moderate	20	>0.05
	Mild	11	

Table 2. Lesion areas on patients' body.

Locations	Number of patients	%
Face	213	99.1
Chest	44	20.5
Back	70	32.6
Others	5	2.3

Table 3. Acnes types and rate (n = 215).

Lesions	Number of patients	%
Papule	213	99.1
Whitehead	189	87.9
Blackhead	180	83.7
Erythema	172	80.0
Pustule	163	75.8
Nodule	17	7.9
Cyst	17	7.9
Telangiectasia	38	17.7
Atrophic scar	23	10.7
Keloid	3	1.4

Table 4. Clinical symptoms (n = 215).

Symptoms	Number of patients	%
Pruritus	64	29.8
Painful	91	42.3
Burning	29	13.5
No symptoms	79	36.7

3.1. Demographics and Clinical Symptoms before Treatments

The age of HENE + Clindamycin and Clindamycin group had the mean ± SD value of 22.6 ± 4.8 and 21.7 ± 5.1, respectively. Two groups are similar in sex and disease severity.

More than 99% of our patients had acne on the face. 20.5%, 32.6% and 2.3% of patients had acne in the chest, back and other positions.

Papule was the lesion that more than 99% of our patients suffered from. Keloid was the least in our study with 1.4%.

29.8%, 42.3% and 13.5% of patients had symptoms like pruritus, pain and burning, consecutively.

3.2. Compared Results from Weekly Treatments

The following **Tables 5-8** indicated the recovery progress from our weekly treatments.

After 1-month treatment, 12.9% and 87.1% of patients in the HENE + Clindamycin group achieved good and moderate results, respectively. Meanwhile, in the Clindamycin group, only 6.7% reached good result. There was no clinical significant difference in efficacy between 2 groups ($p > 0.05$).

Table 5. Comparison of results after 1-month treatment.

Levels	HENE + Clindamycin		Clindamycin		p
	N	%	n	%	
Very good	0	0	0	0	>0.05 ($\chi^2 = 0.669$)
Good	4	12.9	2	6.7	
Moderate	27	87.1	28	93.3	
Poor	0	0	0	0	
Total	31	100	30	100	

Table 6. Comparison of results after 2-month treatment.

Levels	HENE + Clindamycin		Clindamycin		p
	N	%	n	%	
Very good	9	29.0	0	0	<0.05 ($\chi^2 = 16.236$)
Good	20	64.5	18	60.0	
Moderate	2	6.5	12	40.0	
Poor	0	0	0	0	
Total	31	100.0	30	100.0	

Table 7. Comparison of results after 3-month treatment.

Levels	HENE + Clindamycin		Clindamycin		p
	N	%	n	%	
Very good	16	51.6	9	30.0	<0.05 ($\chi^2 = 7.946$)
Good	15	48.4	15	50.0	
Moderate	0	0	6	20.0	
Poor	0	0	0	0	
Total	31	100.0	30	100.0	

Table 8. Comparison of adverse events after 3-month treatment.

Variable	HENE + Clindamycin		Clindamycin		p
	N	%	n	%	
Pruritus	4	12.9	5	16.7	>0.05
Erythema	2	6.5	3	10.0	
Dryness	1	3.2	1	3.3	
Melasma	0	0	0	0	

After 2-month treatment, the percentage of patients in HENE + Clindamycin group acquiring very good result was 29.9%. In contrast, no patients in another group earned the same outcome. The treatment efficacy is better with HENE + Clindamycin than Clindamycin alone ($p < 0.05$).

After 3-month treatment, more than half of patients attained very good result. In the Clindamycin group, there were only 30% of patients gaining the same output. Treatment efficacy is better with HENE + Clindamycin than Clindamycin alone ($p < 0.05$).

After 3 months of treatment, 12.9%, 6.5% and 3.2% of patients in HENE + Clindamycin group suffered from pruritus, erythema and dryness, respectively. In the meantime, 16.7%, 10% and 3.3% of patients in Clindamycin group had the same side effects. AEs during 3 months of treatment in two groups were similar, not significant, which allowed continuing treatments.

4. Discussion

Patients were randomized in 2 groups, with no difference in age, gender, or severity of disease with $p > 0.05$. Therefore, the comparison of treatment results of the two groups is accurate and reliable. The results in **Table 1** shows that after one month of treatment, the patients in the HENE + Clindamycin group and the Clindamycin group meets the moderate and good response rates of 87.1%; 12.9%, respectively; and 93.3%; 6.7% respectively, none of whom achieved good response, the difference was not statistically significant with $p > 0.05$.

Results after 2 months of treatment in **Table 2** show that the proportion of patients in the HENE + Clindamycin group was very good at 29.0%, good 64.5%, moderate 6.5%, while patients in the Clindamycin group only achieved good or moderate level $p < 0.05$.

After 3 months of treatment, as shown in **Table 3**, 100% of the patients in the **HENE** + Clindamycin group shows positive results, of which 51.6% are very good, 48.4% are good, and the Clindamycin group are very good-30.0%, good—50% and moderate 20%; $p < 0.05$.

Therefore, after 3 months of treatment, the efficacy of He-Ne laser treatment in combination with Clindamycin 1% is better than treatment with Clindamycin 1% alone ($p < 0.05$).

According to Avci *et al.* (2013) [1], low-energy laser light therapy had been

shown the efficacy in treating acne up to 70%.

The explanation for the He-Ne laser treatment that effectively treats acne is the effect of the beam on the P. acne bacteria. The pacacillus metabolite produced porphyrin, including uroporphyrin, coproporphyrin III, and protoporphyrin IX, which has a strong absorbing potential with visible light at wavelengths of 400 - 700 nm, in which the blue light is 415 nm, red light 632.8 nm as an endogenous light sensitive substance [2] [5]. The light-absorbing process causes a photochemical reaction that activates free radicals to react and releases millions of oxygen atoms in the hair follicle to kill the P. acnes bacteria without damaging the normal tissues [2]. In addition, the 632.8 nm wavelength also has the ability to penetrate deep into the tissues, directly affecting sebaceous secretion of the sebaceous gland, affecting keratinocyte cells, macrophages and some other cells producing the cytokine, stimulating the growth of fibroblasts and the product of the growth factors; thereby affecting the inflammatory process, healing the wound [5].

The results in **Table 5**, AEs in 2 groups are similar and include mainly pruritus, erythema, dryness. All of AEs are mild or moderate. The limitation of this study is that the severity of our patients is only mild and moderate, our sample size is not large and relapse is not evaluated. There is a need for further randomized control trials accessing the efficacy and safety of He-Ne laser in the treatment of acne vulgaris.

5. Conclusions

- Combination of He-Ne laser and clindamycin is effective in the treatment of mild to moderate acne: very good 51.6%, good 48.4%.
- Combination of He-Ne laser and clindamycin is better than clindamycin alone in treating normal and mild acne.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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