

## 308 nm excimer light to treat 21 cases rhagadia eczema

By Xiang Li, Mei Yuehao, Xu Juan, Wang Jing

308 nm excimer light is currently one of the effective therapeutic methods to cure vitiligo and psoriasis, but there are not so many reports on its therapeutic effect to cure rhagadia eczema reported. Our department used 308 nm excimer light to treat palm and metatarsal rhagadia eczema and observed its clinical therapeutic effect and safety. The following is the result.

### I. Data and Approach

1. Clinical data: From November of 2009 to January of 2011, there were totally 41 cases of patients coming to our hospital to cure rhagadia eczema. According to sequence of diagnosis, following a principle of assigning each case, they were divided into two groups. Treatment group: 21 cases including 11 male patients and 10 female patients; age ranging from 29 to 43 and at an average age of 32.3; 3 cases with course of disease <1 year, 4 cases with course of disease for 1-5 year(s), and 14 cases with course of disease >5 years; control group: 20 cases including 7 male patients and 13 female patients; age ranging from 29 to 57 and at an average age of 31.05; 7 cases with course of disease 1 to 5 year(s), 13 cases with course of disease >5 years. Lesion areas to be treated ranged from 10 to 500 cm<sup>2</sup>, and no any medicine applied as adjuvant therapy during treatment. All patients were classified following Fitzpatrick skin eczema standard to 8 cases of type II skin, 17 cases of type III skin and 16 cases of type IV skin. All the 41 patients with chronic eczema at palm and metatarsal had not applied external use medicine within 1 month, and had no allergic record for UVB irradiation.
2. Therapeutic method: the treatment group was treated with 308 nm excimer light dermatological therapeutic apparatus (product from Shenzhen GSD Technology Co., Ltd.), facula area ranged from 33.8 cm x (0-7.8) cm adjustable, and the maximum irradiation area was 264 cm<sup>2</sup>. MED measurement: selected skin of arm belly from the patients to measure and take MED value as standard multiple to irradiate the 5 faculas from the lower to the higher. Based on arm belly skin erythema reaction, it was to determine the initial dose of irradiation. Due to the thick skin at palm and metatarsal, it generally selected 5-8 times of MED value as the initial dose. 2-3 treatments were performed each week (depended on schedule of the patients) and irradiation dose was increased by 10% to 20% for each time. The control group was treated with narrow-band portable therapeutic apparatus UVB236B (product of German Waldmann Company) with 2 pieces of PL 36W/UVB TL01 tubes (narrow-band UVB) at wavelength of 311 nm and an initial dose of 1 min. Based on lesion reaction, the dose was increased by 10~30 s for each time, 2-3 times irradiation were performed for each week, and pictures were taken for the lesion parts before and after treatment. At completion of 15 times of treatment for 3 months, it was to check the patients again for evaluating the therapeutic effect and adverse reactions.
3. Clinical therapeutic effect evaluation standard<sup>[1]</sup>: It was to evaluate skin symptom and signs by 5 levels ranging 0-4 scores including evaluated items like lesion area, lesion level, pruritus and level of sleep affected. According to improvement level before and after treatment, it was

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Author affiliation: 518033 Shenzhen, Dermatology Department of Futain Hospital Affiliated to Guangdong Medical College

Corresponding author: Wang Jing, Email: jwangray@163.net

to calculate therapeutic indexes. Therapeutic index = (scores before treatment – scores after treatment)/scores before treatment x 100%. Recovery indicates lesions extinct symptom disappeared, therapeutic index >90%; significance indicates lesions remarkably extinct or thinned, symptom remarkably extinct, therapeutic index ranged 60%~89%; improvement indicates lesions obviously extinct or thinned, symptom obviously extinct, therapeutic index ranged 20%~59%; ineffectiveness indicates fail of lesions remarkably extinct, fail of symptom relieved, therapeutic index <20%. Effective rate = (Recovery + efficiency)/total quantity of case.

4. Statistical approach: Using SPSS software,  $\chi^2$  test was performed for the total effective rate of the treatment group and control group.

## II. Conclusion

Clinical therapeutic effect: There were totally 33 lesions with the 21 patients in the treatment group. Most of them showed effective after 2-3 times of irradiation, and the total effective rate after 15 times of irradiation came to 82.4%. The 20 patients in the control group were totally with 31 lesions, and the effective rate after 15 times of irradiation 55%. Effective rate comparison of the two groups was of statistical significance ( $\chi^2=3.99, p<0.05$ ). Please refer to Table 1.

**Table 1:** Clinical therapeutic effect of treating rhagadia eczema with 308 nm excimer light [Case (%)]

Group	Case	Recovery	Significance	Improvement	Ineffectiveness	Effective Rate(%)
Treated group	21	13 (61.9)	5(23.8)	3(14.3)	0	85.7
Contrasting group	20	4(20.0)	5(25.0)	6(30.0)	5(25.0)	55.0

1. Adverse reaction and nursing measures: Among all the patients treated with 308 nm excimer light therapeutic apparatus, only 2 of them trotted with more serious exacerbation of local erythema together with a burning sensation, and 1 patient was with blister at palm. During treatment, irradiation dose was determined based on location of erythra, local skin thickness and measured MED to avoid unexpected burn during irradiation. Within 24 hours after completion of irradiation, keep the skin of lesion part clean and moistened, and keep moistened by applying triethanolamine or urea ointment. Keep the part with rhagadia clean to avoid infection by bacteria. The nursing after 24h also took keeping moisten and clean as the main. Daily food for the patients should be the light diet with nutrition. During treatment, having fish, shrimp, seafood and spicy food was prohibited.

## III. Discussion

Excimer light is the light generated by excimer. Because it is the stable molecule, that's why it is named as excimer light. Its light source is the molecule composed of xenon atom and helium atom. The helium atom may receive an atom from the xenon atom. After activation, the two atoms are in an unstable combined state (excimer), and thus 308 nm excimer light is generated<sup>[2]</sup>. Due to its single wavelength and less phototoxicity, the clinical effect is much higher than NB-UVB<sup>[3-4]</sup>.

We used 308 nm excimer light to treat rhagadia eczema. The result showed that its therapeutic effect is remarkably better than the narrow-band UVB, and no obvious side effects found during the clinical treatment. Both of 308 nm excimer light and 308 nm excimer laser are helium and xenon gas light at 308 nm wavelength, and therapeutic technologies are of the same category. They are the same in therapeutic mechanism with cytotoxic effect to infiltrative T-lymphocyte at lesion, and thus easier to cause T-lymphocyte apoptosis<sup>[5]</sup>. While curing chronic eczema, 308 nm excimer light also plays the function of sterilization and relieving itching, and recovering the scaly skin normal and free of toxic and side effect to human body as well. Therefore, it is a new, safe and effective therapeutic method for curing rhagadia eczema at palm and metatarsal.

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