

ISSN 1008-6455
CN 61-1347/R



CHINESE JOURNAL OF AESTHETIC MEDICINE

中国美容医学

ZHONGGUO MEIRONG YIXUE

中国科技核心期刊（中国科技论文统计源期刊）

俄罗斯《文摘杂志》收录期刊

美国《化学文摘》收录期刊

中国核心期刊（遴选）数据库收录期刊

中国学术期刊综合评价数据库来源期刊

中国科技期刊数据库原文收录期刊

中文生物医学期刊文献数据库 - CMCC 收录期刊

中国期刊网·中国学术期刊（光盘版）全文收录期刊

AESTHETIC MEDICINE

官方微信



更多医美资讯·最新前沿技术
官网: www.zgmr.yx.com

ISSN 1008-6455



VOL.29
2020 **2**

中华人民共和国教育部主管

中国美容医学

二〇二〇年二月

第二十九卷

第二期

Retrospective Analysis of 39 Patients with Acne Erythema Treated by Intense Pulsed Light

HUANG Min, LIU Bing, XING Xiao-jing, LIN Bi-wen, ZHAO Zi-gang, ZHOU Lan-hua, LI Cheng-xin
(Department of Dermatology, the First Medical Center of PLA General Hospital, Beijing 100853, China)

Abstract: Objective To analyze the clinical efficacy and safety of intense pulsed light (IPL) in the treatment of 39 patients with acne erythema in the department of dermatology of PLA General Hospital in recent two years. **Methods** The data of patients with acne erythema were collected from dermatology clinic of our hospital. Statistical analysis of the total efficiency and erythema score improvement after the IPL treatment, as well as the efficiency of different treatment times. **Results** The total efficiency of IPL in the treatment of acne erythema was 66.67%. The score of acne before and after treatment was (2.67 ± 0.48) and $1.28 (1.28 \pm 0.51)$, with significant difference ($P < 0.001$). The efficiency of one to four treatments was 17.95%, 41.03%, 59.09% and 72.73%. **Conclusion** IPL has a good effect on acne erythema, and increasing the frequency of treatment can improve the efficiency.

Key Word: intense pulsed light; acne erythema; safety; erythema score; efficiency

Chinese Library Classification No.: R758.73*3 **Document Code:** A

Article No.: 1008-6455(2020)02-0054-03

Acne is one of the most common skin diseases, and its incidence rate can reach 70%-87% at most. More than 50% patients will still carry the acne after being an adult, accompanied by erythema, hyperpigmentation and cicatrices etc., which will heavily affect the mentality and social contact of patients. In order to effectively control the skin lesion caused by acne, traditional therapies positioned to acne include systematical medication and topical medication. Currently, no specific medicine has been developed to treat the acne scar, erythema and other sequelae. In this thesis, a retrospective analysis is made on the clinic effect of treating the acne erythema by using IPL while observing the therapy's safety and effectiveness so as to provide reference for the clinical treatment of acne erythema.

1. Data and Method

1.1 Case Selection: 39 patients were selected from people diagnosed with acne erythema by

the author from February 2017 to February 2019, including 10 males and 29 females (the male-female ratio 1:2.9). Among them, the minimum age was 19, the maximum age 48 and the average age 25.87. As the male's average age was 21.89, the female's average age was 26.20. Besides, 2 patients were between the age 10 and 20, 32 between the age 20 and 30, 4 between the age 30 and 39 and 1 between the age 39 and 50. Exclusion Criteria: ① patients taking Tretinoin drugs orally within 3 months; ② pregnant women or lactating women; ③ patients sensitive the light and skin-cancer patients; ④ patients exposed to the blazing sun within 4 weeks, patients having mental diseases and severe systemic diseases; ⑤ the consent must be obtained from patients.

1.2 Treatment Method: Ultralite, the multifunctional photonic therapy system by GSD was applied. The IPL energy density was selected at 9-20J/cm², wavelength

200-1200nm, pulse width 5-20ms and flare area 10mmX50mm.

The contact-type water cooling was applied. Usually, at the end of treatment, the treated erythema part would significantly become light or dark purple; if not, 1-2J/cm² energy density could be added to repeat the treatment. Prior to the first treatment, the flare test was conducted for the purpose of selecting appropriate energy parameters, but different treatment energy parameters were selected according to the patient's skin type and the skin lesion color shade. Accordingly, such parameters could be adjusted according to different parts under treatment. Before each treatment, it's required to clean the facial skin; during the treatment, the patient and the operator must wear protective glasses; the treated part was coated with 3mm cold-setting gel; the interval between two treatments was 4 weeks. After the treatment, the patient need clean the face and immediately apply a cold collagen facial mask for 30 minutes. Within 48 hours after the treatment, the patient should avoid any make-up product and strictly protect the skin from the sunlight (SPF 30+ sun cream was recommended) for more than 3 months. However, 17 patients need additionally take minocycline hydrochloride capsule orally to treat the inflammatory papules and pustule.

1.3 Therapeutic Effect Evaluation: the follow-up visit would be paid every 4 weeks, and then the next treatment could be performed. Under relatively fixed photographic conditions, the facial image could be obtained by using the digital camera while recording relevant adverse reactions. Prior to the treatment, according to the degree of acne erythema, four grades could be defined: 0 No Erythema; 1 Mild Erythema/Indistinct Rose Pink Erythema; 2 Medium Erythema/Clearly Visible Erythema;

3 Severe Erythema/Dark Red or Dull Red Erythema^[1]. After the treatment, corresponding evaluation would be performed again, and the decline rate could be calculated according to the total number of skin lesion before and after the treatment(The Skin Lesion Decline Rate=(The Total Number before-The Total Number after)/The Total Number before*100%). However, the decline rate $\geq 90\%$ indicated "Cured", $60\% \leq$ the decline rate $< 90\%$ "Significantly Effective", $20\% \leq$ the decline rate $< 60\%$ "Effective", the decline rate $< 20\%$ or worse "Ineffective". The Overall Efficiency=(Cured+Significantly Effective) Cases/Total Cases*100%.

1.4 Statistical Analysis: The SPSS 17.0 Software was applied to carry out corresponding analysis. Before and after the treatment, t test should be performed. $P < 0.05$ meant that the difference was statistically meaningful.

2. Result

2.1 Treatment Effect: 39 patients accepted the first treatment and the follow-up visit, 22 patients the second treatment and the follow-up visit, 22 patients the third treatment and the follow-up visit and 11 patients the fourth treatment and the follow-up visit. Please refer to Table 1 for the Efficiency after 1-4 IPL treatments. By making a comparison before and after the treatment, 3 cases were cured, 23 cases significantly effective, 13 effective and 3 ineffective with the overall efficiency of 66.67%. Before the treatment, the patient's acne erythema score was (2.67 ± 0.48) , but (1.28 ± 0.51) after the treatment. As the overall score was largely improved, the difference was statistically meaningful ($P < 0.001$). Please refer to Picture 1-2 for typical cases before and after the treatment.

Table 1 Efficiency after 1-4 IPL Treatments (Cases, %)

Treatment	Cured	Significantly Effective	Effective	Ineffective	Effective Rate
After the first treatment	0	7	26	6	17.95
After the second treatment	0	16	20	3	41.03
After the third treatment	1	12	8	1	59.09
After the fourth treatment	2	6	3	0	72.73

2.2 Adverse Reaction: after the treatment, 95% patients were found with mild skin flush or mild skin irritation which would disappear after applying the cold medical facial mask for 30 minutes. No severe adverse reaction was found in 30 patients including hyperpigmentation, hypopigmentation and blister etc..

3. Discussion

The pathogenesis of acne involves the increased sebaceous gland secretion, the hyperkeratosis on the hair follicle funnel part, the epidermal acne propionibacterium infection and immunization and other factors^[2]. Since the acne may damage the skin appearance, the acne patients may face a series of mental problems including anxiety, lower self-assessment and depression etc.^[3-4]. Therefore, the acne patients are in desperate need for the effective treatment of acne and relevant sequelae. Therapies including the oral taking of antibiotics and tretinoin drugs and the topical medication can effectively treat the skin lesion during the acne inflammation period. However, no specific medicine has been developed for the treatment of acne

sequelae like acne erythema, hyperpigmentation and cicatrices etc.. In particular, the treatment of acne erythema plays an important role because acne erythema may deteriorate into cicatrices. Based on previous studies, the possibility of cicatrices caused by the primary acne disease is 5.7%, of which, 83.0% is resulted from the acne erythema^[5].



Note: A-C. Before the Treatment; D-F After three IPL Treatments

Picture 1 Pictures before and after IPL Treatment

Generally, the acne erythema involves the angiotelectasis and acne-free erythema papulas after the appearance of inflammatory acne. As the acne-related flush and erythema consist of blood vessels, the pathogenesis lies in the increased red blood cells and blood volume in capillaries caused by the acne skin lesion during the acute inflammation period and the peripheral tissue inflammation. Small in the diameter, these blood vessels are located

very close to the skin surface and partially subject to the high-density distribution, in which way, some skin parts appear red^[6]. The working principle of IPL treatment is to selectively coagulate the hemoglobin, swell vascular endothelial cells, cramp blood vessels and eventually realize the avascular necrosis without causing obvious damage to the surrounding tissue. Nevertheless, reports differ on the efficiency of IPL treatment in China^[7-10]. In this thesis, the author has conducted a retrospective analysis on 39 acne erythema patients accepting the IPL treatment and concluded its effectiveness and safety as well as the availability of different treatments, which will provide reference for the clinic treatment of acne erythema.

The result shows that, the overall efficiency of treating 39 acne erythema patients by using the IPL achieves 66.67% and the acne score is (1.28 ± 0.51) after the IPL treatment.



Note: A-C. Before the Treatment; D-F After three IPL Treatments

Picture 2 Pictures before and after IPL Treatment

As a large decline can be observed when compared with the score (2.67 ± 0.48) before the treatment, the difference is statistically meaningful. Also, it can be concluded that the erythema color would be significantly improved by reducing the number of skin lesion caused by the acne erythema, and the IPL treatment is indeed effective in treating the acne erythema. Although the efficiency of this retrospective research is similar to that of relevant researches adopting the same evaluation method, there is a great discrepancy against “100% Effective” concluded in some documents, which may result from different efficiency evaluation methods. According to corresponding statistical analysis, when different number of IPL treatment is applied, the efficiency achieve is respectively 17.95%, 41.03%, 59.09% and 72.73%, from which, we can conclude that, as the number of treatment increases, the skin lesion will decrease and the efficiency will increase step by step, but there is no cured case after the first and the second treatment. Therefore, it is recommended that patients need accept more than 3 treatments, in which way, the treatment efficiency can be improved. In addition, while treating the acne erythema, the patient's skin will become more smooth and radiant with the uniform skin color because the IPL thermal effect can stimulate the conversion of fibroblast into fibrocyte, promote the secretion of collagen and increase the dermal collagen^[11]. To sum up, through retrospectively analyzing and concluding the IPL treatment applied to 39 acne erythema patients, the author proves that the IPL treatment could achieve a favorable effect and the increased number of treatment would better the treatment effect. In other words, the IPL treatment can be promoted and widely applied in the clinical practice.

[References]

- [1] Karsai S,Schmitt L, Raulin C.The Pulsed-dye laser as an adjuvant treatment modality in acne vulgaris: a randomized controlled single-blinded trial[J].Br J Dermatol,2010,163(2):395-401.
- [2] Zaenglein AL.Acne vulgaris[J].N Engl J Med,2018,379(14):1343-1352.
- [3] Ramrakha S,Fergusson DM,Horwood LJ,et al.Cumulative mental health consequences of acne:23-year follow-up in a general population birth cohort study[J].Br J Dermatol.2016,175(5):1079-1081.
- [4] Deunn LK,O'Neill JL,Feldman SR.Acne in adolescents:quality of life, self-esteem, mood, and psychological disorders[J].Dermatol Online J,2011,17(1):1.
- [5] Tan J,Bourdes V,Bissonnette R,et al.Prospective study of pathogenesis of atrophic acne scars and role of macular erythema[J].J Drugs Dermatol,2017,16(6):566-572.
- [6] Mathew ML,Karthik R,Mallikarjun M,et al.Intense pulsed light therapy for acne-induced post-inflammatory erythema[J].Indian Dermatol Online J,2018,9(3):159.
- [7] Lv Rong.Observed effect of treating the acne and acne scars by using the IPL[J].Chinese Journal of Laser Medicine & Surgery,2018,27(2):90.
- [8] Li Juan.Simple analysis of the application of IPL treatment in the facial acne erythema and inflammatory hyperpigmentation[J].World Latest Medicine (Abstract Information),2015.15(4):177.
- [9] Zhang Kunmei, Xiang Guang, Wang Chunhui.Comparison between the effect of IPL treatment and that of red light treatment[J].Chinese Journal of Dermatology and Venereology,2012,26(11):997-998.
- [10] Deng Jinghang, Wang Fei, Huang Maofang.Comparison between the effect of IPL treatment and that of red light treatment[J].Chinese Journal of Aesthetic Medicine,2014,4(2):55-63.
- [11] Zhang Hui, Dong Wei, Zhai Yan.Analysis of the clinical effect of IPL & fruit acid facial rejuvenation treatment[J].Chinese Journal of Aesthetic Medicine,2016,25(7):58-60.

[Date of Receiving] May 22, 2019

Format of References: Huang Min, Liu Bing, Xing Xiaojing, etc al.
Retrospective Analysis of 39 Patients with Acne Erythema Treated by using the Intense Pulsed Light[J]. Chinese Journal of Aesthetic Medicine,2020,29(2):54-56.

Notice on the Unified E-mail Contact Information Issued by Chinese Journal of Aesthetic Medicine

From March 1, 2019 on, *Chinese Journal of Aesthetic Medicine* E-mail box for thesis submission and admission notice sending is zgmryx@163.com; the rejection and revision E-mail box is zgmryxtxj@163.com; if you have any question, please dial the phone number 029-83659967 (Editorial Office) or contact us via our official Wechat (account: *Chinese Journal of Aesthetic Medicine*). This is the Notice!

Editorial Office