

# APPLICATION OF IPL TECHNOLOGY IN ACNE VULGARIS TREATMENT: A CASE REPORT

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A – study design, B – data collection, C – statistical analysis, D – interpretation of data, E – manuscript preparation, F – literature review, G – sourcing of funding

## ABSTRACT

**Background:** Intense pulsed light (IPL) technology has been used by cosmetic and medical practitioner since 1990. Initially it was only used to remove unnecessary hair, but over time, it began to be used for anti-aging treatments, removing erythema, acne lesions, and acne scars.

**Aim of the study:** The aim of this study is to investigate how the use of IPL technology has affected acne lesions and to determine whether the condition of the patient's skin has improved.

**Material and methods:** A young woman who was struggling with ordinary acne underwent a series of treatments using IPL technology to reduce skin eruptions.

**Results:** The study subject was a 22-year-old patient who had been suffering from acne vulgaris for several years. The skin on her face exhibited changes in the form of pustules, blackheads, and lumps. The entire treatment series was 10 weeks. Prior to the procedure, a very thorough interview was conducted, during which all contraindications were excluded. The Hellgren-Vincent scale, which is used to determine the severity of acne lesions, accurately determines the amount of skin lesions in the form of lumps, pustules, and blackheads.

**Conclusions:** As demonstrated by this study, IPL technology has been beneficial for the condition of the patient's skin. Pictures from before and after unambiguously indicate the positive effect of intense pulsed light. There has been great improvement in the skin's overall condition, with reduced acne lesions (lumps, pustules, blackheads).

**KEYWORDS:** IPL technology, acne vulgaris, cosmetology

## BACKGROUND

IPL technology is nothing more than intense pulsed light therapy, the usage of which has been applied since 1990 [1]. Initially it was used for removing unnecessary hair [2]. IPL technology devices operate by emitting a beam of radiation in the wavelength range of 560 nm–1200 nm. They significantly differ from lasers as their characteristic feature is unstable wavelength, as well as a non-parallel beam of radiation, and a polychromatic emission beam. There is no risk of skin burns as a result [3].

Acne vulgaris is a problem which affects not only people in puberty but also people over 30 or 40 years old [4]. It is a difficult disease because the changes are observed on the face and they cannot be entirely covered. The cause of acne changes is very complex and in each case has a different course [5]. The most frequent cause is a disturbed production of sebum and the formation of calluses in the hair follicles, as well as the presence of the bacteria *Propionibacterium acnes* [7].

The first signs of the acne's formation are the blackheads. From this moment on, one should pay attention to skin care. The usage of proper cosmetics is indeed the most important factor in the fight against this disease [6,12].

The treatment of acne vulgaris with IPL technology involves the destruction of the bacteria responsible for the disease [8,11]. The proper device for the treatment of acne vulgaris uses waves from 500 nm–1200 nm. However, the best spectrum is a wavelength in the 530 nm–700 nm range [9]. Reduction of the amount of acne pellets has been observed during treatment with the green, yellow, and violet lights. The best effects, however, are visible during simultaneous treatment with green light and violet light [10].

## AIM OF THE STUDY

The aim of the paper is to present the application of IPL technology within the treatment of acne vulgaris

on the basis of a description of the case study. Additionally, the paper describes the operation of devices emitting intense pulsed light, the etiopathogenesis of the acne vulgaris, as well as the role of proper care of acne-affected skin.

## MATERIAL AND METHODS

Within the presented paper, the author used an IPL device—specifically, the GSD sPTF model with the MA no. 2 lamp. The analysis of the skin involved a special piece of equipment from the Beauty of Science company, called the Nati skin analyzer. The initial analysis of the patient's skin utilized the Hellgren-Vincent scale which helps to define the stage of advancement of acne changes in grades according to degree of severity.

Table 1. The Hellgren-Vincent scale

The Hellgren-Vincent scale	
I°	erythema, blackheads, 1 – 5 pustules or papules
II°	erythema, blackheads, 6 – 10 pustules or papules
III°	erythema, blackheads, 11 – 20 pustules or papules
IV°	erythema, blackheads, 21 – 30 pustules or papules
V°	erythema, blackheads, over 30 pustules or papules

The treatment used a lamp designed to fight against acne changes (AC), a wavelength of 400–1200 nm and emitted energy from 13–14 J. There were 5 flashes per single lamp position with a maximum of 100 flashes on the total face area.

## CASE STUDY

The research was based on a case study featuring a 22-year-old patient who had struggled with acne vulgaris for several years. The acne changes were located across the entire area of the skin on her face. Pustules, papules, and blackheads were observed.

The research was carried out at Public Higher Medical Professional School in Opole after gaining permission from the Bioethical Commission. The entire series of treatments lasted for ten days. The first examination was carried out in December 2016. Each subsequent treatment was made in one-week intervals.

In order to participate in all of the examinations and treatments, the patient needed to give written permission. She was informed about all possible sensations that could occur during treatment, as well as during at-home care. All contraindications were ruled out, including pregnancy, breastfeeding, cancers and tumors of unknown origin, suntan, application of antibiotic ointments, application of photosensitizing herbs, psoriasis, herpes in the active phase, active infections on the treatment area, epilepsy, and taking isotretinoin.

The first examination included a careful analysis of the skin and it was made using the Nati skin analyzer. The analysis looked at the level of epidermal exfoliation,

the greasiness of the skin, and the hydration level of the skin in the T and U zones. Data from the pre-treatment examination were saved for later comparison following the series of treatments. The IPL treatment was conducted after the skin analysis. The level of greasiness of the patient's skin before the treatments was unusually high at 58.31% (typically, it should be about 15%-20%). The level of skin exfoliation was in the normal range, falling at 14.59% (the norm is 14%). Before the series of treatments, hydration in the T zone was alarming. The value of hydration was 12%. Hydration in the U zone was also non-typical at 35%. The correct value for skin hydration in the T and U zones should fall in the 41%–65% range.

The first treatment was carried out with the lowest level of intense pulsed light (level 5-3J), in order to see how the skin reacted to the radiation. During the treatment, the patient was asked how she was feeling. The patient said that the treatment was not painful or uncomfortable, and that she only felt warmth. The most sensitive area was around the mouth. Ultrasound gel was used in order to make it easy for the light to penetrate the skin. The light's power level was increased during each subsequent treatment. The last 5 treatments were carried out using a power level of 1 / 14 J. After the treatment the patient did not apply makeup up for 24 hours, only using a specified nourishing cream in order to encourage the skin to regenerate quickly. At home, she obeyed all care recommendations.

The second examination using the Nati skin analyzer was carried out after the tenth treatment. It was found that the level of greasiness improved after the series of treatments. During the second evaluation, the value of greasiness was 24.62%. The value of exfoliation was 16.72%. After the series of treatments, the level of hydration in the T zone was still alarming, however, it had improved, now equaling 24%. The level of hydration in the U zone was still far from where it should have been. After the series of the treatments it deteriorated, now equaling 28%.

## DISCUSSION

After a precise analysis of the results of the Nati skin analyzer examinations, it was proven that the application of IPL technology to treat acne vulgaris did have the anticipated effects. The pustules or papules had largely subsided and the inflammation of the patient's skin had also decreased. Other parameters of the skin had likewise undergone a change. Greasiness decreased from about 58% to about 24% (tab. 2). Hydration of the skin in the T and U zones changed slightly. The initial values were 12% (T zone) and 35% (U zone). However, after the series of treatments, the values were 24% (T zone) and 28% (U zone) (tab. 4). Exfoliation changed the least, increasing from about 14% to 16% (tab. 3). The structure of the patient's skin had not changed. Erythema reduced from level IV to level III according to the Hellgren-Vincent scale (tab. 1).

Wang B, Wu Y, Luo Y.J., Xu X.G. authored the article *Combination of intense pulsed light and fractional CO<sub>2</sub> laser treatments for patients with acne with inflammatory and scarring lesions* where, they described the treatment of acne by applying the IPL device and CO<sub>2</sub> fractional laser. The treatment involved 2 patients suffering from inflammatory acne and wounds. The research predominantly included patients from China. They made 4–6 IPL treatments followed by 2 treatments using the CO<sub>2</sub> fractional laser. The IPL treatment significantly decreased the amount of acne changes and lowered the level of pain in those areas. The subsequent treatments using the CO<sub>2</sub> fractional laser additionally reduced the number of wounds. Approximately 90% of the patients experienced significant or moderate improvement.

In their article, Monika Patidar, Ashish Ramchandra Deshmukh, and Maruti Yadav Khedkar described very interesting and positive effects of the IPL method of acne vulgaris treatment, as well. They worked out a method of treating acne vulgaris using two different power levels of the IPL device. They conducted their research on 45 people suffering from facial acne vulgaris. The people participating in the research ranged in age from 16–28 years. The right side of the face underwent light radiation at an intensity of 35J/cm<sup>2</sup>, while the left side underwent treatment at an intensity of 20J/cm<sup>2</sup>. Each person with acne vulgaris underwent 4 treatments using the IPL device at two-week intervals. The results of the efficiency of using IPL in the treatment of acne were analyzed using the Mann-Whitney U test. On the right side, they achieved a perfect result. That means IPL conclusively worked in the treatment of acne vulgaris for 10 people (22%), with good results for 22 people (49%), and with moderate results for 13 people (29%). On the left side, they achieved a perfect result for 7 people (15%), a good outcome for 19 people (42%), and moderate results for 16 people (43%).

## CONCLUSIONS

Due to the series of treatments that were carried out using IPL technology and the presentation of the researchers' results, one may draw the following conclusions:

1. Application of IPL technology reduced the amount of acne efflorescence on the patient's face.

## REFERENCES

1. Keyyan N, ed. *Lasers in dermatology and medicine*. Springer Science & Business Media; 2011.
2. Wróblewska I, Maj J, Chilicka-Jasionowska K, ed. *Aparatura kosmetyczna i metodyka zabiegów*. Opole: Państwowa Medyczna Wyższa Szkoła Zawodowa w Opolu, Studio IMPRESO Przemysław Biliczak; 2013. (in Polish).
3. Padlewska K. *Medycyna estetyczna i kosmetologia*. Warszawa: Wydawnictwo Lekarskie PZWL; 2014. (in Polish).
4. Jabłońska S, Majewski S. *Choroby skóry i choroby przenoszone drogą płciową*. Warszawa: Wydawnictwo Lekarskie PZWL;

Table 2. The range of values for the level of greasiness of the skin.

Measurement	Unit	Range		Description
		From	To	
Greasiness	%	0	10	Dry skin
Greasiness	%	11	14	Skin with a tendency for drying
Greasiness	%	15	20	Proper greasiness of the skin
Greasiness	%	21	25	Skin with a tendency for becoming greasy
Greasiness	%	26	100	Oily skin

Table 3. The range of exfoliation measurement values

Measurement	Unit	Range		Description
		From	To	
Exfoliation	%	0	14	Within normal range
Exfoliation	%	15	20	Above normal
Exfoliation	%	21	100	Excessive

Table 4. Range of values of hydration

Measurement	Unit	Range		Description
		From	To	
T zone hydration	%	0	24	Alarming
T zone hydration	%	25	40	Below normal
T zone hydration	%	41	65	Within normal range

2. The series of treatments using intense pulsed light produced great improvement in the appearance of the patient's skin.
3. Hydration of the T and U zones, exfoliation of dead epidermal cells, and skin greasiness levels improved due to the series of 10 IPL device treatments.
4. The patient may continue to maintain the effects of the treatment by following proper at-home skin care recommendations.
5. Such research encourages patients suffering from acne to take advantage of the latest technological improvements as well as to use services of beauty salons to improve their condition.

2013. (in Polish).

5. Nast A, Dreno B, Bettoli V. Europejskie wytyczne leczenia trądziku oparte na faktach (S3) – aktualizacja z 2016 roku – wersja skrócona. *Dermatol Prakt* 2016; 43(3). (in Polish).
6. Rycroft RJG, Robertson SJ, Wakelin SH. *Dermatologia*. Warszawa: Wydawnictwo Lekarskie PZWL; 2014. (in Polish).
7. Baumann L. *Dermatologia estetyczna*. Warszawa: Wydawnictwo Lekarskie PZWL; 2013. (in Polish).
8. Błaszczuk-Kostanecka M, Wolska H. *Dermatologia w praktyce*. Wyd. 2. Warszawa: Wydawnictwo Lekarskie PZWL. (in Polish).

9. Goldberg DJ. Lasery i światło. Tom 2. Wrocław: Wydawnictwo Elsevier Urban & Partner; 2009. (in Polish).
10. Duława J. Vademecum medycyny wewnętrznej. Warszawa: Wydawnictwo Lekarskie PZWL; 2015. (in Polish).
11. Goliszewska A, Gromek M, Padlewska K, Witkowska D. Kosmetologia pielęgnacyjna. Warszawa: Wydawnictwo WSZ Kosmetyki i Pielęgnacji Zdrowia; 2011. (in Polish).
12. Kamińska A, Jabłońska K, Drobnik A. Praktyczna kosmetologia krok po kroku. Warszawa: Wydawnictwo Lekarskie PZWL; 2014. (in Polish).

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Word count: 1811

• Tables: 4

• Figures: –

• References: 12

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**Sources of funding:**

The research was funded by the authors.

**Conflicts of interests:**

The authors report that there were no conflicts of interest.

**Cite this article as:**

Koziołek A, Chilicka K.  
Application of IPL technology in *Acne Vulgaris* treatment: a case report.  
MSP 2018; 12, 2: 39–42.

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Received: 13.03.2018

Reviewed: 23.05.2018

Accepted: 11.06.2018