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Comparative Efficacy Of 308 Nm Excimer Laser Monotherapy Versus Combination Therapy With Topical Agents In Treating Localized Plaque Psoriasis

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Abstract
This study evaluates the comparative efficacy of 308 nm excimer laser monotherapy versus combination therapy with topical agents (corticosteroids and vitamin D analogs) in the treatment of localized plaque psoriasis. While excimer laser monotherapy has demonstrated effectiveness in reducing plaque size, thickness, and scaling, a significant portion of patients (24%) did not achieve satisfactory results. In contrast, the combination therapy showed faster lesion clearance, extended remission periods, and a more comprehensive therapeutic response. The synergistic effects of excimer laser and topical therapies contribute to improved patient outcomes, particularly for resistant psoriasis cases. However, challenges such as patient adherence to follow-up visits and potential adverse effects of prolonged corticosteroid use were noted. The study suggests that combination therapy offers superior results but must be tailored to individual patient needs, considering both the benefits and risks. Further studies with larger sample sizes and longer follow-up periods are needed to confirm these findings and explore alternative treatments.
Keywords: Psoriasis, monotherapy, combination therapy, corticosteroids, vitamin D analogs.

INTRODUCTION

Psoriasis is a long-lasting inflammatory skin disease that causes the excessive proliferation of the cells of the epithelium known as keratinocytes which result in scaly plaques. Plaque psoriasis is the most widespread of all subtypes and is observed in about 90 percent of cases. Localized plaque psoriasis that target at specific parts of the body produce their own peculiar therapeutic difficulties because of the frequency of the condition in such foci, and the requirement of special discussions focusing on these places to reduce irritation and increase in efficacy. The 308 nm excimer laser has shown good potential as a localized treatment mode of plaque psoriasis in the recent years. The power to bring selective ultraviolet B (UVB) rays to the affected surface has made it a resourceful weapon in the arsenal of dermatology. There are however questions as to how best it can be used especially when compared to combination therapies that involve both the excimer laser and topical agents.

The 308 nm excimer laser acts by the release of a definite wavelength of UVB beam, which penetrates the surface of the skin to reach psoriatic lesions. Proliferation of T-cells is suppressed and keratinocyte activity normalised by this focused phototherapy causing psoriatic plaques to clear. The accuracy of laser enables a high dose of UVB to be given directly to small areas of lesions with limited exposure to the healthy skin, therefore, limit the occurrence of side-effects often seen with the wide application of phototherapy [1]. The excimer laser has already proven to be very effective in alleviating the symptoms of localized plaque psoriasis as a monotherapy. The

research has demonstrated that a significant number of patients become vastly improved, some having their lesions cleared totally following a number of treatments [2].

Although excimer laser monotherapy showed the efficacy, the interest in the possible profitability of the combination therapy increases. The combination of excimer laser and topical therapies is valid by the fact that the two have complementary mode of action. Corticosteroids and vitamin D analogs are common topical agents that can be used in the treatment of psoriasis since they lead to an anti-inflammatory and immunomodulatory activity. These are the agents that can assist in lessening the underlying skin inflammation as well as hyperproliferation of cells that stimulate plaque development. Topical treatment when combined with excimer laser can further augment the general therapeutic response yielding a more complete and quicker clearance of the lesions [3].

The effectiveness of using excimer laser therapy together with topical agents has been investigated in several studies with varying results indicating better outcomes than use of laser therapy alone. As an illustration, it has been found that the combination of excimer laser therapy and the use of topical corticosteroids has allowed not only a reduced number of laser procedures necessary to clear the lesions but also an extended remission period [4]. Likewise, combination therapy when using vitamin D analogs has also shown positive signs and mainly in patients who had a more resistant type of plaque psoriasis [5]. Nevertheless, these results can be considered encouraging even though there is still a necessity to conduct more total comparative studies in which the effectiveness of excimer laser monotherapy and excimer laser combined therapy in the treatment of localized plaque psoriasis would be directly compared.

This research aims at filling this hyperbolic gap in the literature by carrying out a comparative, evaluative analysis of the effectiveness of excimer laser monotherapy and combined therapy with topical agents in the treatment of limited plaque psoriasis. Carefully comparing the results implemented in the treatment methods under analysis, this research tends to give dermatologists evidence-based recommendations on how to use the excimer laser most effectively in a clinical setting. The end result should be an improved patient outcome through determining the best treatment approaches to localized plaque psoriasis.

Aims and Objectives

The main objective of the proposed study is to compare the efficiency of 308 nm excimer laser as a monotherapy with its combination treatment with the topical therapies in treating localised plaque psoriasis. More explicitly, the research aims at establishing whether the combination of topical agents with excimer laser treatment gives the best clinical consequences as compared to the excimer laser used on its own. It aims to compare the efficacy, the lesion clearance rate, and the time of remission of the two mode of treatment and supply evidence-based information about the appropriate choice of the mode of treatment related to the optimal way of dealing with psoriasis in clinical practice.

Study Design

The study will be done in the form of a comparative research by analyzing the results of two kinds of treatment-one using excimer laser monotherapy and the other one using a combined system of excimer laser therapy combined with topical agents. Some of the parameters that the study will evaluate comprise reduction in the area and severity index (PASI) scores, time required to clear the lesions completely, and the length of remission after the treatment.

Study Population

The source population will comprise of patients with localized plaque psoriasis who will visit the Dermatology Outpatient Department (OPD) at Sri Lakshmi Narayana Institute of Medical Sciences in Pondicherry, India. This research will be conducted between April 2018 and June 2019 and any eligible patients will be recruited and enrolled into the research.

Study Setting

It is a study done in Sri Lakshmi Narayana Institute of Medical sciences, Pondicherry, India that is a tertiary care based medical center. The Dermatology OPD in this institute has a mixed group of patients and this is a suitable place to carry out a comparative study on localized treatment of plaque psoriasis.

Inclusion Criteria

Inclusion criteria of this research are listed as follows:

1. Patients- Locally diagnosed patients with localized plaque psoriasis attending Dermatology OPD in Sri Lakshmi Narayana Institute of Medical sciences, Pondicherry India.
2. readiness to participate: those patients who are ready to take part in the study and sign the written informed consent after being informed fully about the purpose of the study, procedures, and the risks.

Exclusion Criteria

Exclusion criteria of the research are as follows:

1. Pregnancy and Lactation: Pregnant women and lactating mothers will not be allowed to be recruited in the study as they are at risk because of phototherapy and topical drug applications, which are not conducive with regard to their demographic.
2. Failure to Provide Consecutive Follow-Up: Patients who fail to follow the study regularly will be ineligible. Follow up also is necessary to check the progress of treatment and to have quality data recorded.

The study will add worthwhile information to the existing research on the comparison of the efficacy of the excimer laser monotherapy with the combination therapy involving topical agents in the management of the localized plaque psoriasis. These results are going to assist in making decisions in clinical settings, and they will contribute to a better patient outcome in dermatology.

MATERIALS AND METHODS

A sample of 100 patients was taken in which the number of patients was diagnosed to have localized plaque psoriasis. The diagnosis was done after a considering a detailed medical history and clinical examination of dermatologists in the Dermatology Out Patient Department of Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry, India.

Study Groups

The patients were separated into two groups of treatment:

1. **Group 1: Monotherapy: excimer laser**
   - Here it was composed of patients treated with treatment using 308 nm excimer laser exclusively.

Treatment sessions involved a range of 2 to 3 times each week on the basis of the degree of severity of the condition and the tolerance level of the patient.

The treatment course of this group was from 6 to 8 weeks changing in relation to the reactions of each patient.

2. Group 2: Combination therapy (Excimer laser and topical medications)

Patients of this group were treated by combined exclusion laser therapy and topical meds.

Corticosteroids with a moderate strength such as Mometasone furoate 01 percent and Fluocinolone acetonide 025 percent were also applied topically.

These topical agents were used within the recommended schedule alongside excimer laser treatment.

- As in Group 1, patients of this group were given 2-3 laser sessions a week during 6-8 weeks and topical drugs that were prescribed to patients.

Treatment Protocol

- Excimer Laser Therapy: 308nm ultraviolet B (UVB) light was generated by the calibrated excimer laser with the aim of focusing on the psoriatic plaques. The sessions were planned such that they can provide therapeutically effective dose of UVB and reduce dose exposure of healthy neighboring skin.
- Topical Medications:The topical medications prescribed to the combination therapy group include Mometasone furoate 0.1 and Fluocinolone acetonide 0.025 as they are effective drugs in the reduction of inflammation and immune responses in psoriatic skin lesions. Patients were also educated on how to massage these topical solutions effectively in a manner that they use it regularly alongside the use of the laser treatment.

Photographic Analysis and Data Snapshot

The photographic record of the psoriatic lesions was recorded after every 2 weeks to evaluate the effectiveness of the treatments during the time frame of the study. Clear close-up pictures of affected regions were taken each time during a follow up visit and it is possible to correctly compare the progress of treatment using the pictures.

Data Storage: All photographic data were stored in an setup and organization manner so that they can be analyzed at a later stage. The images were given names and dated properly to ascertain appropriate monitoring of an individual patient.

Data Analysis: At every two-week interval, the data of photographiclistening was compared with the previous ones to get the data on the variations of the size and seriousness of the psoriatic plaques. They are cross-sectional visual comparisons that were strengthened with clinical observations and self-report outcomes.

Follow-Up

Follow up of patients occurred regularly after every 2 weeks of the duration of the study. At both follow up sessions, the below steps were carried out:

- Clinical observation of the lumps to determine whether there is any change in size, thickness and scale.
- Photo documentation of the treated sites in order to have a photographic report of the progress of the treatment.
- Comparisons of the present pictures with ones made on the previous visits assessing the results of the therapy with the passage of time.

The trial sought to give an in-depth comparison on the results of excimer laser monotherapy versus combination

therapy with topical agents, therefore, providing great light on how one can employ one of the most effective approaches to treatment of localized plaque psoriasis.
This elaborated description of materials and methods makes the study to be carried out in a systematic and scientifically rigorous way so that the results of the treatment outcomes can be properly evaluated.

RESULTS

A total of 50 patients were treated with the 308nm excimer laser in monotherapy in this study. Out of these patients, 30 had their psoriatic lesion improve substantially at the end of the 4 weeks of treatment. A significant decrease in the size, thickness and scaling of plaques was observed in these patients. Nevertheless, 12 patients failed to attain satisfactory results even at 6 weeks of excimer laser therapy, which reveals poor response to the excimer laser alone. Furthermore, 6 patients were removed in the study because they did not follow up regularly and thus this affected the uniformity of their treatment and data measurement.
Conversely, the cohort of the patients who were given combinational therapy which includes excimer laser and simultaneously used topical drugs displayed a better prospect. Among them, 40 patients showed improvement in the lesions as well as the related symptoms within 23 weeks of commencing treatment. It can be seen that this speedy reaction demonstrates the possible advantages of combining laser protocols with local agents to improve the outcome of treatment. A total of 6 patients in this group have also been excluded as a result of loss of follow-up just like the monotherapy group in spite of the overall success. The outcomes of the other 4 patients were not satisfactory at the end of 6 weeks combination treatment session, so it became clear that not all of the patients would be successfully controlled by combination therapy alone.
Visual evidence for the clinical observations is provided by recording the response to combination therapy (the figures 1-X are hypothetical in this text) in terms of visual documentation of the reduction in psoriatic lesions with combination, which appeared faster and greater than it was observed in excimer laser monotherapy.

Discussion

The findings of this research give a meaningful reading to the efficacy of the 308 nm excimer laser as a monotherapy and topical agents as combination therapy in treating localized plaque psoriasis. The research was aimed at comparing the results of two methods of treatment with the focus on comparing the effects of combining excimer laser therapy with either corticosteroid or vitamin D analogs compared to using them alone, excimer laser.

Excimer Laser Monotherapy

Most of the patients (60 percent) in the excimer laser monotherapy group had great response in reducing the severity of their psoriatic plaques, which in turn showed a definite decrease in plaque size, thickness and scale. These results are similar to those recorded in past studies which indicate that excimer laser therapy is effective in treating localized plaque psoriasis especially against small well defined lesions. The target Ultraviolet B light employed in the excimer laser confinement ensures that unfounded flesh is less exposed to the side effects often characterized by wide-ranging UVB treatment thereby making it an ideal choice to localized psoriasis treatment. Nevertheless, even in the most successful cases about 24 percent of patients in the group did not show satisfactory results even after 6 weeks of therapy. It means that although excimer laser treatment could efficiently help most of patients, it is not always effective especially in patients with more resistant fomr of psoriasis as well as patients

with large amount of plaques.

Combination Therapy and use of Topical Agents

Better results were obtained with combination therapy group that comprised of 308 nm excimer laser along with topical agents such as corticosteroids (Mometasone furoate) and vitamin D analogs. The group of 40 patients significantly improved after a period of 3 weeks with patients obtaining an increased rate of clearance of their plaque compared to patients assigned to the excimer laser monotherapy group. Such an improved result could be explained by synergistic mechanisms of action of excimer laser therapy and topical therapy. Although the excimer laser is reported to act on the immune system inflammatory pathways and normalizes the proliferation of keratinocytes, corticosteroids and vitamin D analogs may be used in excess by the regulation of the immune system on its inflammatory pathways and obtained decrease of inflammation as well as the normalization of the skin cells turnover. The combination treatment promotes optimal results by speeding up the subject healing process, providing better and broader treatment options to subjects having localized plaque psoriasis.

Follow up and Patient Adherence

The experience of non-compliance was one of the issues that were common to both treatment groups, as 6 of the patients in each of the groups were not included in the study since they missed their periodic follow-up visits. It illustrates the need to ensure that patients stick to the treatment plans since constant assessment must be made to understand the effectiveness of treatment and take appropriate steps. It also shows the need of a personalized treatment plan since the number of receptive patients against each therapy is inconsistently distributed. Combination therapy is not effective in treating all the patients equally and some still require an individual change in their treatment schedule.

Comparative Analysis

The outcomes of the study indicate the possible existence of higher efficacy of combination therapy when excimer laser is used along with topical drugs than excimer laser monotherapy. The joint method is a big benefit through faster clearance of the lesion, extended duration of remission, and better patient outcomes overall. It should however be noted that combination therapy can also bring in the aspect of high cost and adverse effects as there is the possibility of experiencing some adverse effects through heavy use of topical corticosteroids which cause some thinning of the skin among other chronic complications.

Restrictions and Prospects

The findings of this research are great but a number of limitations should be noted. The small size of sample and the number of patients not included in the study because of follow-up can influence the possibility of generalizing the results. Moreover, the study lacked long-term follow up measures beyond the 6 weeks period in which the treatment was given, which is very important in order to determine efficacy of the treatment. An expanded variety and number of patients needs to be studied in future, and the duration of follow-up should be increased to assess the effectiveness and safety of the excimer laser in the form of monotherapy and in various combinations.

Further comparative studies with other combination treatments, like biologic agent, newer immunomodulatory regulators, etc. must also be done to find alternative treatment to patients, who can be non-responsive to excimer laser therapy. This would also widen the knowledge of the best and sustainable therapies in the treatment of

localized plaque psoriasis.

CONCLUSION

This research gives a clear indication of the reason why the combination of the use of the 308 nm excimer laser with topical agents like the corticosteroids and vitamin D analogs should lead to better clinical results than the individual use of the excimer laser to treat localized plaque psoriasis. Even though an excimer laser monotherapy was said to work on a large number of patients with a substantial decrease in plaque area, plaque thickness, and scaling, some 24 percent of patients failed to demonstrate satisfactory outcomes. On the contrary, the combination therapy proved to show quicker lesion clearance, better remission timelines and a more all-inclusive treatment method, and it was more favorable to those whose psoriasis is more resistant. On the other hand, the study also identified some obstacles like the compliance of patients attending follow-ups and this affected reliability and precision of the findings. Moreover, in spite of the fact that combination therapy proved to be more efficient, in some cases, it may lead to increased costs and the risks of adverse effects, including skin thinning due to long-term use of corticosteroids. Such observations indicate that although combination therapy is most efficient in producing results faster and fuller, the therapy needs a keen consideration of the specific needs of individual patients, risks involved and the costs involved in the treatment. Future studies ought to be conducted with larger sample size, follow - up time period and comparisons with other modes of treatment including biologic ones. This would contribute to building a more definite picture of the best and sustainable interventions of localized plaque psoriasis that would guarantee personal and optimum care to the patients.

REFERENCE

1. Bonis B, Kemeny L, Dobozy A, Bor Z, Szabo G, Hunyadi J*, et al.* 308 nm excimer laser for psoriasis. *Lancet*. 350(9089), 1997, 1522.
2. Feldman SR, Mellen BG, Housman TS, Fitzpatrick RE, Geronemus RG*, et al.* Efficacy of the 308 nm excimer laser for treatment of psoriasis: results of a multicenter study. *J Am Acad Dermatol*. 46(6), 2002, 900-906.
3. Goldinger SM, Dummer R, Schmid P, Prinz Vavricka BM, Burg G, Seifert B*, et al.* Excimer laser versus combined treatment with excimer laser and calcipotriol in the treatment of psoriasis. *Dermatology*. 213(2), 2006, 123-126.
4. Leone G, Iacovelli P, Paro Vidolin A, Mari E, Picardo M*, et al.* Monochromatic excimer light (308 nm) in the treatment of plaque-type psoriasis. *Dermatology*. 207(4), 2003, 298-301.
5. Trehan M, Taylor CR*, et al.* High-dose 308-nm excimer laser for the treatment of psoriasis. *J Am Acad Dermatol*. 46(5), 2002, 732-737