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Clinical Study of Efficacy of Excimer Laser in Mucosal Vitiligo

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Conflict of interest: Nil

Abstract

Background: Vitiligo is an acquired pigmentation disorder of the skin. It accounts for 3 to 4 % of op attendance. Worldwide incidence is 1%. It is associated with cutaneous, systemic diseases and affects psychologically, leading to high morbidity, but life expectancy is almost the same as it is a cosmetic disorder. It has a prolonged course and varied outcomes so it's a therapeutic challenge.[1] Excimer 308nm laser is one of the forms of targeted Phototherapy that delivers a specific wavelength (308 nm). UVB is done via a handheld piece of different shapes. It is used for the treatment of localized Vitiligo and is often combined with topical therapies like calcineuron Inhibitors and topical steroids, systemic therapies like steroids and immunomodulators. e.g., levamisole and antioxidants to enhance response.[2] Limited clinical studies are present on the efficacy of Excimer Laser in Vitiligo. More case studies are warranted in order to better understand the efficacy of Excimer Laser in Mucosal Vitiligo.

Aims and Objectives: To evaluate the clinical efficacy and safety of excimer laser in the treatment of Mucosal Vitiligo.

Materials and Methods: 20 patients with mucosal vitiligo who were attended to DVL department between October 2024 to April 2025 were taken for the study. Written informed consent, history, clinical examination in a prestructured proforma was taken. Excimer laser with a frequency of 2 times in a week with monitoring of investigations, side effects were done. All the collected data was tabulated in a master chart and prepared in Microsoft excel.

Results: This study was conducted on 20 patients with mucosal vitiligo who presented to DVL OPD at Santhiram Medical College and General Hospital, Nandyal. In the present study, out of 20 patients, 15%

were in age group 0 to 20, 50% were in age group 21 to 40, 25% were in age group 41 to 60, 10% were in age group 61 to 80. Out of 20 patients, 60% were males and 40% were females. Out of 20 patients, 55% are of skin type 5, 45% are skin type 4. Out of 20, 65% had disease duration of less than 1 year, 35% had more than 1 year. Out of 20, 20% had positive family history, 80% had negative family history. Out of 20, 15% had hypothyroidism, 5% had diabetes mellitus. Out of 20, 20% had associated koebners phenomenon, 80% had no koebners phenomenon. Out of 20, 45% had PGAS grading I, 40% had PGAS II, 15 % had PGAS III grading. Out of 20 patients, 40% showed mild Improvement, 25% showed moderate Improvement, 20% showed good Improvement, 15% showed excellent Improvement. Out of 20 pts, erythema was seen in 44.4% pts, blistering in 22.2%pts, perilesional hyperpigmentation in 22.2% pts, herpes labialis in 11.1% pts.

Conclusion: Excimer Laser showed mild to moderate response in the treatment of mucosal vitiligo in terms of objective and subjective efficacy. Local side effects were minimal and not significant. Factors affecting repigmentation response were the age of the patient, duration of disease. This study confirms that repigmentation by excimer laser in mucosal vitiligo is a viable option. It is a safe, effective, and simple technique with mild to moderate repigmentation and less adverse effects.

Keywords*:* Excimer Laser, Mucosal vitiligo, Efficacy.

Introduction

Vitiligo is a common, chronic, autoimmune-acquired skin discoloration that affects skin and mucous membranes with well-defined, chalky white macules on their surfaces. Leukoderma describes these macules with a known cause. Normal or white (poliosis) hair may be present over the lesion. Synonyms are Kilas(white-spotted deer), Padasphota, Twakpushpi, Sweta Kustha, Bohak, bahak, baras, Zoraat, Shirabito**.**[3] The Ailment was first mentioned in writing in the classic Tarikh-e-Tib-e-Iran during the Aushooryan period (2200 BC). The Ebers Papyrus (1550 BC) contains pharmacological descriptions of two skin-color-altering diseases: (a) those with tumors, most likely leprosy, and (b) those with simple color changes, most likely Vitiligo. It seems that the word "vitiligo" is derived from the Latin word "vitium," which means "defect." De-Mediccina, written by the Roman physician Celsus, coined the term "vitiligo".[3] The term excimer is 'excited dimer'. Excimer lasers are usually noble gas halide type so the term excimer is a misnomer. (The term is exciplex laser, i.e., excited complex). The excimer laser was used in 1960 by Fritz Houtermans. It is used in combination with other drugs in localized, resistant areas and children (grade of recommendation B). The beam is adjusted to the treatment area shape using filters of different shapes. The treating dermatologist and the patient wore protective eyewear during the procedure. A predetermined test dose with escalation according to skin phototype is used to calculate MED 24 hours after exposure of approximately 1 cm x 1 cm regions on the upper back. At the test site, MED is defined as the lowest UVB dosage that causes perceptible erythema. The average MED for type 4 skin was 600 mJ/cm^2; for type 5 skin, it was 1100 mJ/cm 2. Prior to the subsequent phototherapy session, the erythema response is evaluated and classified as follows: no erythema, mild erythema that is hardly noticeable (grade 1), moderate, well-defined, asymptomatic erythema (grade 2), and severe painful erythema that lasts longer than 24 hours (grade 3).[11]

Aims and Objectives

1. To evaluate the clinical efficacy of excimer laser in the treatment of Mucosal Vitiligo.
2. To evaluate the safety of excimer laser in the treatment of Mucosal Vitiligo.

Materials and Methods

Study Design and Sample Size

This is a Prospective, hospital-based, observational investigative study conducted in a tertiary care center over a period of one year done from October 2024 to April 2025 A total of 20 patients attending DVL OPD with mucosal vitilgo were included in the study.

Inclusion Criteria

All patients of all age groups with mucosal vitiligo will be included in the study.

Exclusion Criteria

Patients who were not given written informed consent were excluded.

Patients with contraindications to excimer laser like photosensitive dermatosis, drugs causing photosensitivity.

Methodology

This study was observational Prospective case study, conducted over a period from June 2024 to feb 2025. Approval for the study was taken from the Institutional Ethics Committee. Informed written consent for participation in the study, for the Excimer Laser was taken from patients. It was conducted on 20 patients of both gender and all ages attending DVL OPD of SRMC/GH. All patients with a clinical diagnosis of mucosal vitiligo who meet inclusion criteria were included in the study. Patients who did not give Informed written consent, Patients with contraindications to excimer laser were excluded from the study. Detailed history and clinical assessment findings were recorded as per the preformed, pre-structured proformas.

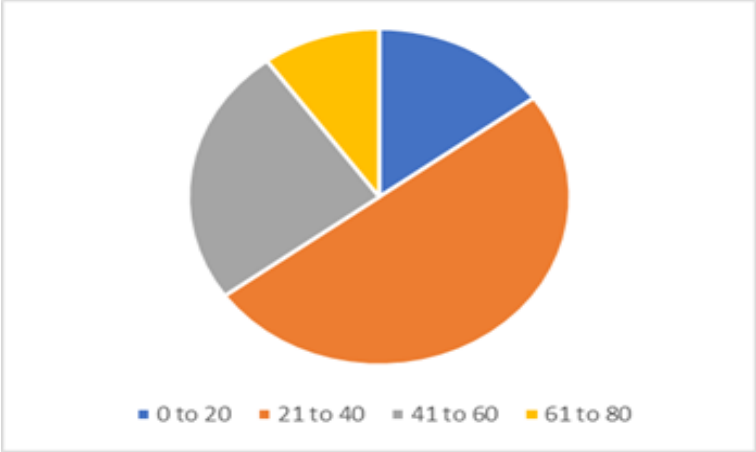
Clinical Photographs were taken at the start and completion of the study (end of 3 months). Investigations like CBP, Blood Grouping, S. Ferritin and Thyroid profile and opthalmological checkup were done prior to the excimer laser and monitored during the study. The initial dose based on the MED was given and the increments were based on recommendations, individual response, and local side effect profile. Repigmentation was assessed objectively by physician global assessment scale (PGAS) and subjectively by patient assessment. Local side effects were noted. All the data was collected into proforma, tabulated in a master chart and prepared in Microsoft excel.

Results

Table 1: Distribution of Age

Age Range	Number	Percentage (%)
0 to 20	3	15
21 to 40	10	50
41 to 60	5	25
61 to 80	2	10

Graph 1: Distribution of Age.

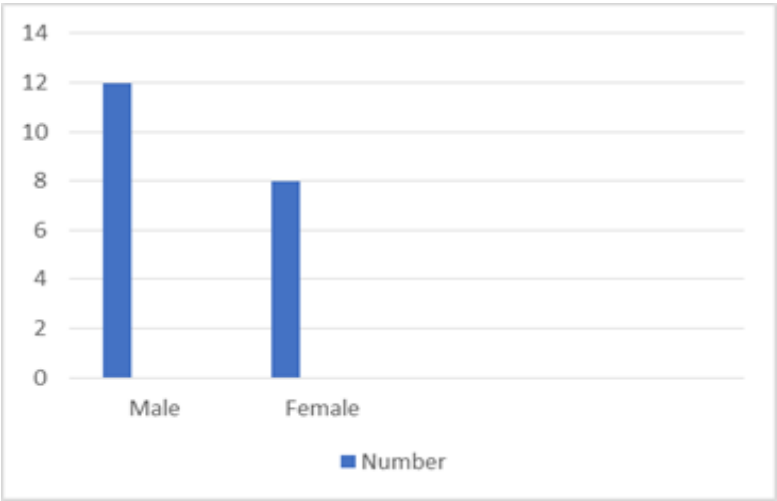


Out of 20 patients, 15% are in age group 0 to 20, 50% are in age group 21 to 40, 25% are in age group 41 to 60, 10% are in age group 61 to 80.

Table 2: Distribution of Gender.

Gender	Number	Percentage (%)
Male	12	60
Female	8	40

Graph 2: Distribution of Gender.

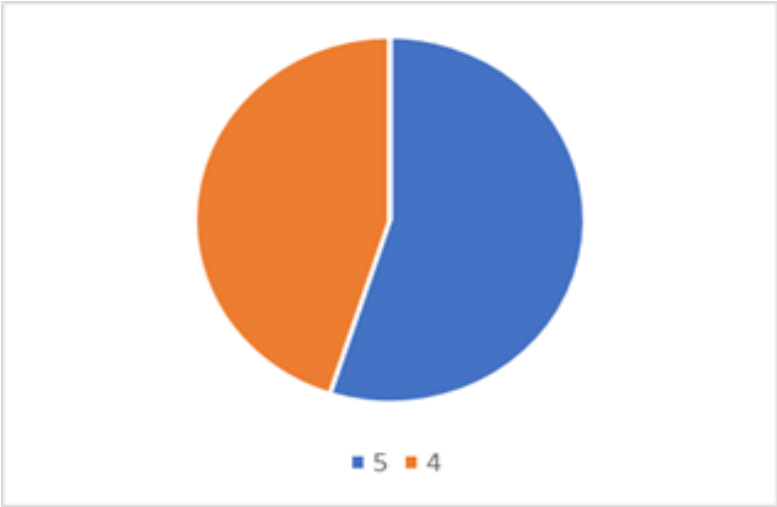


Out of 20 patients, 60% were males and 40% were females.

Table 3: Fitzpatrick skin type

Fitzpatrick skin type	Number	Percentage (%)
5	11	55
4	9	45

Graph 3: Fitzpatrick skin type.

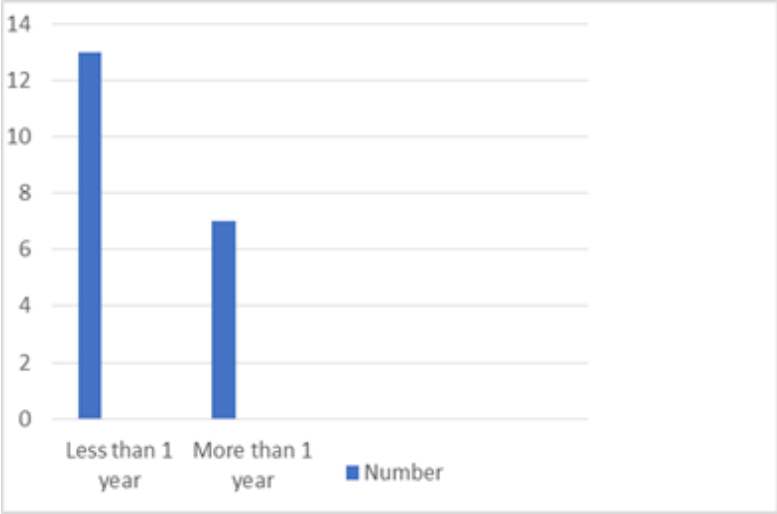


Out of 20 patients, 55% are of skin type 5, 45% are skin type 4.

Table 4: Duration of Disease

Duration	Number	Percentage (%)
Less than 1 year	13	65
More than 1 year	7	35

Graph 4: Duration of Disease.

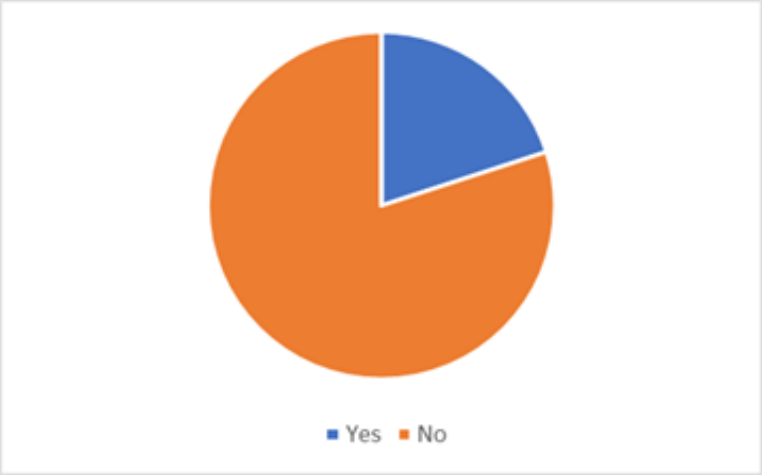


Out of 20, 65% had disease duration of less than 1 year, 35% had more than 1 year.

Table 5: Family History

Family History	Number	Percentage (%)
Yes	4	20
No	16	80

Graph 5: Family History

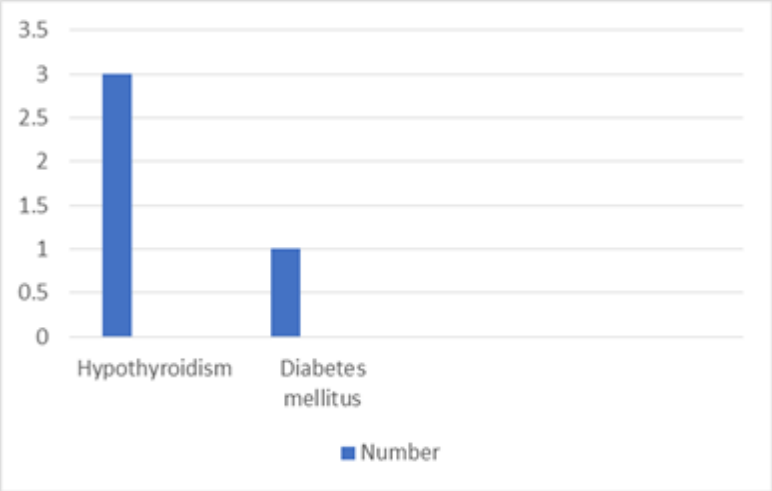


Out of 20, 20% had positive family history, 80% had negative family history.

Table 6: Associated Comorbidities.

Associated Comorbidities	Number	Percentage (%)
Hypothyroidism	3	15
Diabetes mellitus	1	5

Graph 6: Associated Comorbidities.

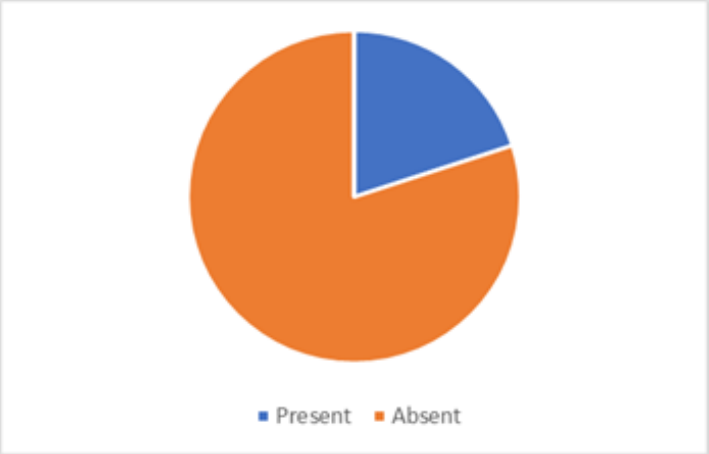


Out of 20, 15% had hypothyroidism, 5% had diabetes mellitus.

Table 7: Koebners phenomenon

Koebners phenomenon	Number	Percentage (%)
Present	4	20
Absent	16	80

Graph 7: Koebners phenomenon.

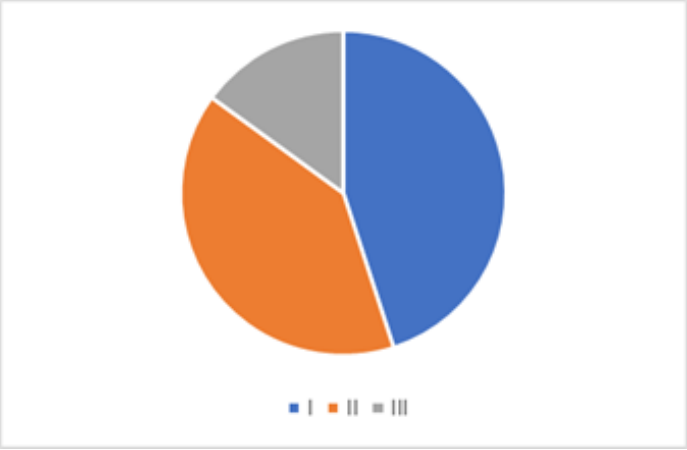


Out of 20, 20% had associated koebners phenomenon, 80% had no koebners phenomenon

Table 8: Grade of Re pigmentation (PGAS)

PGAS Grading	Number	Percentage (%)	P Value
I	9	45	0.749
II	8	40	0.496
III	3	15	0.092

Graph 8: Grade of Re pigmentation (PGAS)

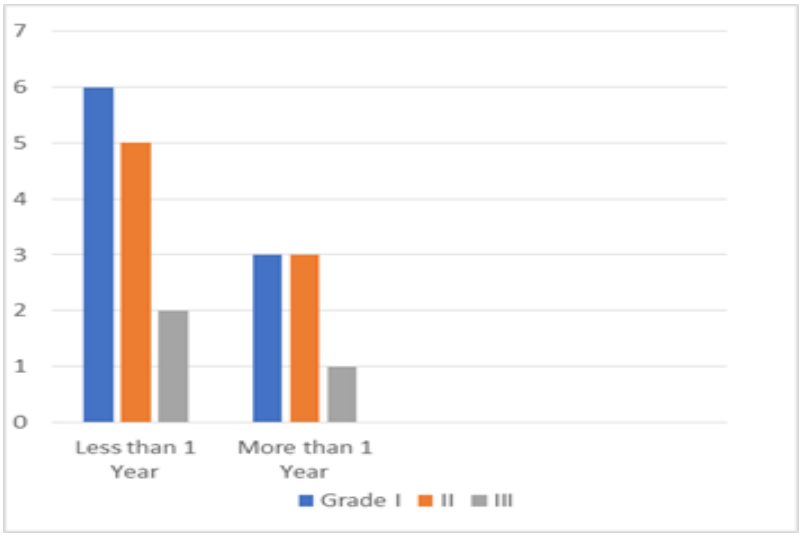


Out of 20, 45% had PGA grading I, 40% had PGA II, 15 % had PGA III grading.

Table 9: Duration of disease and Grade of Repigmentation (PGAS) at 3 months

Duration of disease	PGAS Grade I	Percentage (%)	PGAS Grade II	Percentage (%)	PGAS Grade III	Percentage (%)
Less than 1 Year	6	66.9	5	62.5	2	66.6
More than 1 Year	3	33.3	3	37.5	1	33.3

Graph 9: Duration of disease and Grade of Repigmentation (PGAS) at 3 months.



Out of 9 pts with PGAS Grade I repigmentation, 66.9% had duration of disease less than 1 year, 33.3% had duration of disease more than 1 year.

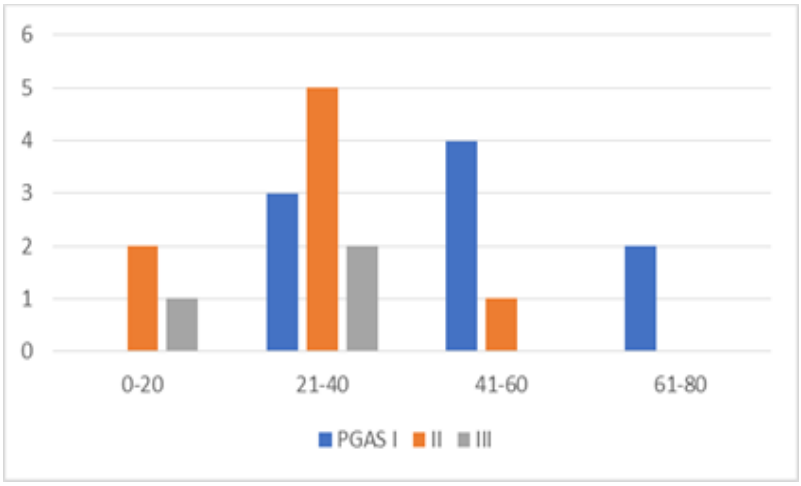
Out of 8 pts with PGAS Grade II repigmentation, 62.5% had duration of disease less than 1 year, 37.5%had duration of disease more than 1 year.

Out of 3 pts with PGAS Grade III repigmentation, 66.6% had duration of disease less than 1 year, 33.3% had duration of disease more than 1 year.

Table 10: Age and Grade of Repigmentation (PGAS)

Age group	PGAS I	Percentage (%)	PGAS II	Percentage (%)	PGAS III	Percentage (%)
0-20	0	0	2	25	1	33.3
21-40	3	33.3	5	62.5	2	66.6
41-60	4	44.4	1	12.5	0	0
61-80	2	22.2	0	0	0	0

Graph 10: Age and Grade of Repigmentation (PGAS)



Out of 9 pts with Grade I repigmentation, 0% were in the age group of 0 to 20 yrs, 33.3% were in age group of 21 to 40yrs, 44.4% were in the age group of 41 to 60 yrs, 22.2% were in age group of 61 to 80 yrs.

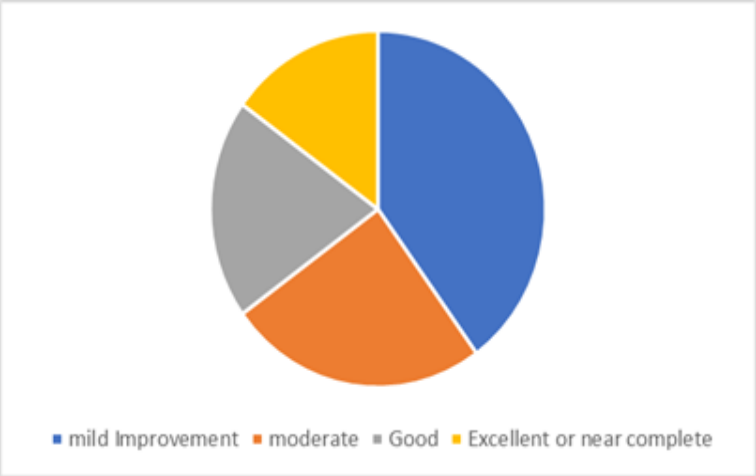
Out of 8 pts with Grade II repigmentation, 25% were in the age group of 0 to 20 yrs, 62.5% were in age group of 21 to 40yrs, 12.5% were in the age group of 41 to 60 yrs, 0% were in age group of 61 to 80 yrs.

Out of 3 pts with Grade III repigmentation, 33.3% were in the age group of 0 to 20 yrs, 66.6% were in age group of 21 to 40yrs, 0% were in the age group of 41 to 60 yrs, 0% were in age group of 61 to 80 yrs.

Table 11: Subjective Efficacy

Grade of improvement	Number	Percentage (%)
mild Improvement	8	40
moderate	5	25
Good	4	20
Excellent or near complete	3	15

Graph 11: Subjective Efficacy

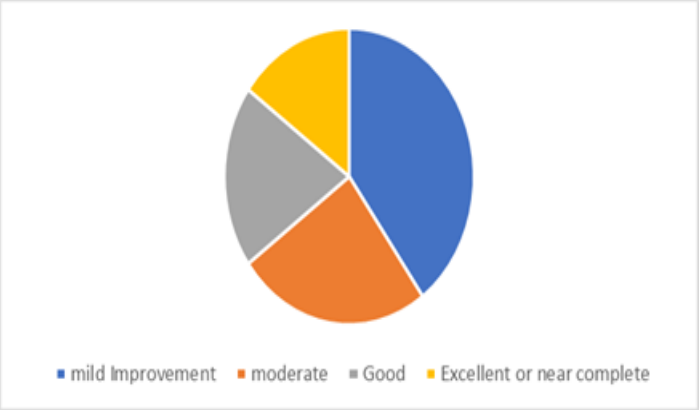


Out of 20 patients, 40% showed mild Improvement, 25% showed moderate Improvement, 20% showed good Improvement, 15% showed excellent Improvement.

Table 12: Side effects

Side effects	Number	Percentage (%)
Erythema	4	44.4
Blistering	2	22.2
Perilesional Hyperpigmentation	2	22.2
Herpes labialis	1	11.1

Graph 12: Side effects



Out of 20 pts, erythema was seen in 44.4% pts, blistering in 22.2% pts, perilesional hyperpigmentation in 22.2% pts, herpes labialis in 11.1% pts.

Discussion

In the present study, A total of 20 cases were included in this study and all patients were followed up successfully. Every patient completed the study. In the present study, patients ranged in age from 5 to 68 years, with a mean age of 30.4years. Ostovari et al.[10], in his study included patients aged 11 to 74 years, with a mean age of 43.9 years. In the present study, there was a predominance of males (60%) compared to females (40%). Ostovari et al.[10] reported a female predominance, with 28 females and 7 males. In the current study, the mean duration of disease was 1.5 years. Hassan Seirafi et al. reported a mean disease duration of 2 years. In the current study, 20% patients had a positive family history, while 80% had a negative family history.

In the present study, 11 patients had Fitzpatrick skin type V, and 9 had skin type IV. Ostovariet al.[10] reported 5 patients with type II, 17 with type III, 12 with type IV, and 1 with type VI skin type. In the current study, among 20 patients, 3 had hypothyroidism, 1 had diabetes mellitus. Baltas et al.[13] reported 2 out of 6 patients with hypothyroidism. In the present study, 4 out of 20 patients exhibited Koebner's phenomenon. Al-Otaibi et al.[16] in his study reported Koebner's phenomenon in 11 out of 34 patients. In the present study, treatment consisted of 2 sessions per week for 24 weeks. Esposito et al. (2004)[14] continued sessions for 36 weeks. In the present study, the mean cumulative dose was 5.20 J/cm². Gerber et al.in his study reported a mean cumulative dose of 6.25 J/ cm².

In the current study, In terms of objective efficacy, majority of patients were in PGAS (Physician Global Assessment Scale) Grade I (45%), followed by Grade II (40%), Grade III (15%). Hadi et al. (2006)[15] observed that 50% of vitiligo patches showed 75% or more pigmentation. In the current study, In terms of Subjective efficacy, 8 patients rated their response as mild, 5 as moderate, and 4 as good, 3 as excellent. Esposito et al. (2004) [14] reported 7 patients with excellent and 25 each with good and moderate responses.

Variables of Repigmentation are Age, Duration of Disease. In the present study, in patients with Grade III repigmentation, 66.6% are in age group of 21 to 40yrs. In the present study, in patients with Grade III repigmentation, 66.6% had duration of disease less than 1 year. In terms of side effects, Out of 20 pts, erythema seen in 44.4% pts, blistering in 22.2% pts, Perilesional hyperpigmentation in 22.2% pts, herpes labialis in 11.1% pts. Erythema was the most common side effect with the perioral area being the most frequently affected site. Choi et al. (2004) noted erythema (11%) and bullous lesions (11%) in his study.

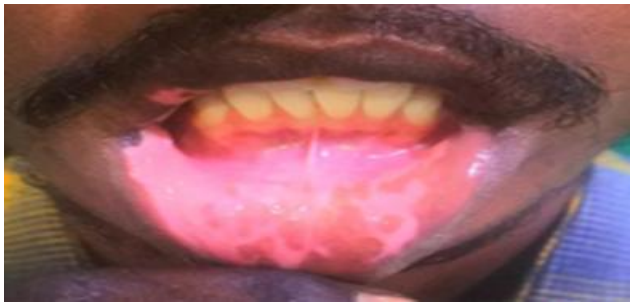
Conclusion

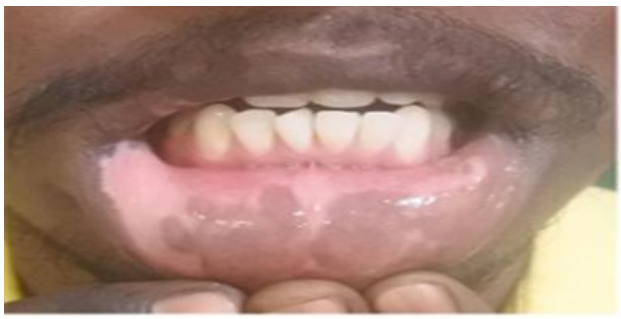
Excimer Laser showed mild to moderate response in the treatment of mucosal vitiligo. Grade I PGAS repigmentation (>75 percent repigmentation) was seen in 45 % of cases, grade II (50 to 75 percent repigmentation) was seen in 40 % of cases and grade III (less than 50 percent repigmentation) in 15% of cases.

Mild subjective assessment grade was noted in 40%, moderate in 25%, good in 20% and excellent assessment in 15% of patients. 30 % of patients showed local side effects.

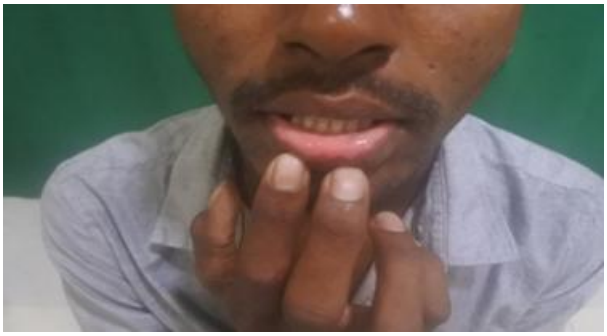
Erythema (44.4%) was the most common side effect noted. Factors affecting repigmentation response were the age of the patient, duration of disease. Patients with a duration of disease less than 1 year showed more response. This study confirms that repigmentation by excimer laser in mucosal vitiligo is a viable option. It is a safe,effective, and simple technique with mild to moderate repigmentation and less significant adverse effects.

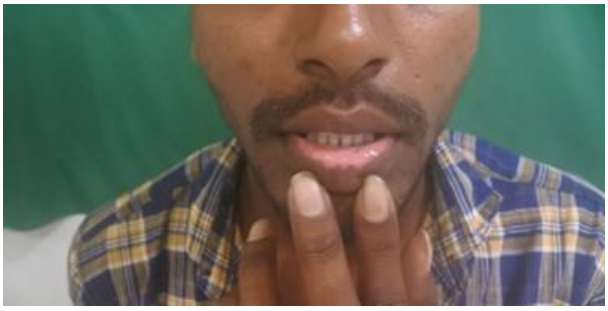
PGA-III Repigmentation (Before and after 3 months)





PGA-II Repigmentation (Before and after 3 months)





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