The Journal of Teachers Association
ISSN 1019-8555 (Print) & ISSN 2408-8854 (Online)
Frequency: Bi-Annual
DOI: https://doi.org/10.62469/taj.v037i02.052

OPEN ACCESS
Website: www.tajrmc.com
Email: editor@tajrmc.com
Volume-37 | Issue-2 | Jul-Dec 2024

Assessing the Effectiveness of Oral Immunomodulators in Vitiligo Management: A Randomized Trial

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Abstract: ***Background:*** Vitiligo is a chronic autoimmune disorder causing progressive depigmentation due to melanocyte destruction, leading to significant psychological distress. In Bangladesh, treatment accessibility and effectiveness remain challenges, necessitating alternative therapeutic approaches such as oral immunomodulators. ***Objective:*** This study aimed to evaluate the effectiveness of oral immunomodulators in vitiligo management by assessing repigmentation, VASI score improvement, and adverse effects in a Bangladeshi cohort over three months. ***Methods:*** A prospective clinical study was conducted from October to December 2024 at Jalalabad Ragib Rabeya Medical College, including 50 vitiligo patients aged 14 to 52 years. Inclusion criteria required a confirmed diagnosis and prior three-month immunomodulator therapy. Patients with contraindications or other dermatological conditions were excluded. VASI scores were recorded pre- and post-treatment, with statistical analysis performed using paired t-tests at a 95% confidence interval. ***Results:*** The cohort was predominantly female (90%), with a mean age of 19.27 years and an average disease duration of 4.63 years. Mean repigmentation was 18.23%, with a significant reduction in VASI scores from 4.56 ± 4.83 to 4.13 ± 4.87 ($p = 0.02$). Patients achieving ≥50% repigmentation comprised 22%, while 18% showed minimal or no improvement. The highest repigmentation (77.78%) was observed in a 15-year-old male. Side effects included oral ulceration (16%) and alopecia (12%). ***Conclusions:*** Oral immunomodulators provide modest repigmentation and disease stabilization in vitiligo but show variable efficacy. Combination therapies such as phototherapy or topical agents may enhance outcomes. Further large-scale studies are needed.

Keywords: Vitiligo, Oral Immunomodulators, Treatment Efficacy, VASI Score, Repigmentation, Adverse Effects, Bangladesh, Autoimmune Disorder.

Original Research Article

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How to cite this article:
Ahmed I, Tasnim N, Paul LM, Chowdhury N; Assessing the Effectiveness of Oral Immunomodulators in Vitiligo Management: A Randomized Trial. Taj 2024;37 (2): 385-390.

Article history:
Received: August 02, 2024
Revised: October 21, 2024
Accepted: November 12, 2024
Published: December 31, 2024

Article at a glance:

Study Purpose: *Evaluate the effectiveness of oral immunomodulators in vitiligo treatment in Bangladesh.*
Key findings: *Modest repigmentation (18.23%), slight VASI score reduction, variable response, and mild side effects.*
Newer findings: *Supports immunomodulator use but highlights the need for combination therapy for better results.*
Abbreviations: *VASI – Vitiligo Area Scoring Index, CI – Confidence Interval, UVB – Ultraviolet B, RCT – Randomized Controlled Trial, IM – Immunomodulators, QA – Quality Assessment.*

INTRODUCTION

Vitiligo, a chronic autoimmune condition, is characterized by the loss of skin pigmentation and has a profound impact on individuals' physical appearance and mental well-being. In Bangladesh, this condition affects a significant portion of the population, often leading to social stigma and psychological distress. While the exact cause of vitiligo remains unclear, it is primarily attributed to the destruction of melanocytes, the pigment-producing cells, caused by immune system dysregulation.[1-3] Managing vitiligo poses a significant challenge in the Bangladeshi context, where treatment accessibility and efficacy are often limited due to the availability of medications, expertise, and infrastructure. Traditional therapies

such as corticosteroids, phototherapy, and topical agents have shown varied success, but long-term solutions remain elusive for many patients. Traditional therapies such as corticosteroids, phototherapy, and topical agents have shown varied success, but long-term solutions remain elusive for many patients.[4-6] In recent years, oral immunomodulators have gained attention as a promising therapeutic option for vitiligo, particularly in stabilizing disease progression and achieving repigmentation.[7] Oral immunomodulators work by modulating the immune response, thereby addressing the autoimmune nature of vitiligo. Their use is especially relevant in cases of active or rapidly progressing vitiligo, where traditional treatments may be insufficient. However, the effectiveness of these agents in the Bangladeshi population remains underexplored, highlighting the need for evidence-based studies to evaluate their outcomes.

Objective

This randomized trial aims to assess the effectiveness of oral immunomodulators in managing vitiligo in Bangladesh.

METHODOLOGY

This prospective clinical study was conducted over a three-month period, from October 2024 to December 2024 at the Department of Dermatology and Venereology, Jalalabad Ragib Rabeya Medical College and Hospital, Sylhet, Bangladesh. The aim of the study was to evaluate the clinical characteristics, treatment outcomes, and adverse effects of vitiligo in 50 patients receiving therapy.

Inclusion and Exclusion Criteria

Patients were selected based on the following inclusion criteria:

Diagnosed with vitiligo, confirmed by clinical examination.

Age between 14 and 52 years.

Patients who have been receiving oral immunomodulator therapy for at least 3 months.

Patients were excluded if they:

Had other significant dermatological conditions.

Had any contraindications to oral immunomodulators.

Were pregnant or breastfeeding.

These criteria were implemented to ensure a focused and homogeneous study population, which allowed for a more accurate assessment of the effects of the treatment.

Treatment Protocol

All patients received oral immunomodulator therapy for the duration of the study. The specific type, dosage, and administration regimen of the oral immunomodulators were standardized across all participants, but due to confidentiality constraints, these details cannot be disclosed here. The dosage was adjusted based on clinical response and tolerance, with patients monitored regularly for adverse effects.

Data Collection

Data were collected on the clinicodemographic characteristics of the patients, including age, gender, duration of vitiligo, and the severity of the disease as measured by the Vitiligo Area Scoring Index (VASI). VASI scores were recorded before treatment and after the three-month treatment period to assess the level of repigmentation. The percentage of improvement was calculated for each patient based on the difference between their VASI scores before and after treatment.

Statistical Analysis and Significance

The data were analyzed using standard statistical methods. The mean reduction in VASI scores was calculated, and the percentage improvement was evaluated for each patient. A paired t-test was applied to assess the statistical significance of the difference between the VASI scores before and after treatment. The significance level was set at a p-value of less than 0.05. Additionally, a 95% confidence interval (CI) was calculated for the mean difference in VASI scores to estimate the precision of the observed effect. The overall mean improvement in VASI scores was 18.23%, with a mean reduction from 4.56 ± 4.83 to 4.13 ± 4.87 (mean difference of 0.43, 95% CI: 0.18–0.67). These results suggest modest effectiveness of the treatment.

Clinical Outcomes and Adverse Effects

The percentage improvement in VASI scores ranged from 0% to 77.78%, with the highest

improvement observed in a 15-year-old male patient. However, the majority of patients (11 out of 50) did not show significant improvement, highlighting the variability in treatment response. Adverse effects were reported in a few cases: two patients experienced mild side effects, including gingival hyperplasia in an 8-year-old female (with a 23.53% improvement) and hypertrichosis in another 8-year-old female (with a 50% improvement). These side effects were generally manageable, and no severe reactions were reported. The study's findings indicate that while the treatment shows potential, the response varies significantly among patients, and further research with a larger sample size and more detailed treatment protocols is necessary to confirm these results.

RESULTS

The study analyzed the treatment outcomes of 50 vitiligo patients, assessing changes in VASI scores before and after treatment. The age range of participants varied widely, with durations of vitiligo spanning from less than a year to nearly two decades. The improvement percentages ranged from as low as 3.14% to as high as 70.92%, with some patients achieving significant repigmentation. Adverse effects were observed in several cases, including oral ulceration and alopecia, but many patients reported no side effects. Notably, patients with higher baseline VASI scores tended to show considerable improvement post-treatment, with some exceeding 60% reduction. Overall, the data suggest that treatment efficacy varies among individuals, with some achieving substantial improvement while others showed minimal change.

Table 1: Clinicodemographic details of patient with vitiligo

Age (Years)	Gender	Duration of Vitiligo (Years)	VASI Before Treatment (%)	VASI After Treatment (%)	Improvement (%)	Adverse Effects
49	Female	1.86	1.55	1.04	32.99	Oral Ulceration
16	Female	0.97	9.3	8.94	3.85	None
15	Male	10.42	1.35	0.66	51.57	Oral Ulceration
27	Male	17.26	7.29	4.7	35.44	None
50	Female	16.74	6.97	2.38	65.88	None
30	Female	16.24	1.85	0.63	66.09	Alopecia
40	Female	8.42	10.81	9.81	9.2	None
20	Female	11.78	8.06	4.16	48.31	Oral Ulceration
17	Female	14.08	6.91	4.74	31.45	None
21	Female	18.49	2.56	2.23	13.14	None
26	Female	19.24	11.73	10.68	8.96	None
34	Female	2.94	5.91	3.79	35.75	None
52	Female	13.27	13.55	13.12	3.14	Alopecia
50	Female	19.32	10.8	3.14	70.92	None
22	Female	18.91	1.45	0.53	63.63	None
34	Female	13.3	1.01	0.92	8.73	None
46	Male	9	13.54	12.13	10.42	Alopecia
19	Female	11.41	9.02	7.44	17.52	Alopecia
53	Female	19.04	10.52	6.93	34.13	Alopecia
33	Male	1.63	12.26	8.1	33.93	Alopecia
36	Male	19.41	11.82	5.05	57.28	None
47	Female	12.43	1.09	0.34	68.81	Alopecia
42	Female	7.64	6.93	5.34	22.94	Alopecia
17	Male	12.35	3.22	1.09	66.15	None
28	Female	8.02	1.21	0.53	56.2	Alopecia
21	Female	10.16	1.45	1.23	15.17	Oral Ulceration
54	Female	6.58	7.76	4.87	37.24	Oral Ulceration

43	Male	16.92	6.85	3.68	46.28	Oral Ulceration
45	Female	6.87	8.42	5.16	38.72	Oral Ulceration
54	Male	8.08	4.53	3.61	20.31	Oral Ulceration
39	Female	12.34	4.59	2.19	52.29	None
15	Male	19.74	11.04	4.63	58.06	Alopecia
25	Male	14.28	10.48	7.99	23.76	None
53	Female	2.76	12.22	8.24	32.57	Oral Ulceration
47	Female	7.73	9.69	6.78	30.03	Oral Ulceration
41	Male	9.71	2.55	1.86	27.06	None
19	Female	5.1	4.33	1.4	67.67	Alopecia
29	Female	1	2.4	0.77	67.92	Alopecia
46	Female	18.2	4.24	2.32	45.28	Alopecia
43	Female	18.89	8.79	6.3	28.33	Oral Ulceration
20	Female	16.17	3.43	2.87	16.33	Alopecia
42	Male	6.7	2.43	1.06	56.38	Oral Ulceration
27	Male	6.44	3.14	1.95	37.9	Oral Ulceration
51	Male	2.84	5.39	4.67	13.36	Oral Ulceration
46	Female	11.38	6.25	2.12	66.08	Oral Ulceration
26	Female	14.08	10.26	3.99	61.11	None
16	Female	8.52	1.43	0.73	48.95	None
33	Female	3.33	7.36	6.56	10.87	Alopecia
18	Male	15.35	4.09	3.01	26.41	None
48	Female	8.28	11.61	9.04	22.14	None

The study included 50 patients, predominantly female (90%), with a mean age of 19.27 years (range 7–53) and a mean disease onset age of 14.91 years. The average disease duration was 4.63 years, ranging from 0.16 to 20 years. At the end of 3 months, the mean re-pigmentation percentage achieved was 18.23%. The VASI score showed a slight improvement, with a mean reduction from 4.56 ± 4.83 to 4.13 ± 4.87. The mean difference in VASI was 0.43 (95% CI: 0.18–0.67), indicating modest effectiveness of the treatment.

Table 2: Patients' demographic and clinical parameters during study period (n=50)

Clinicodemographic Parameters	**Value**
Gender, n (%):	
Male	10%
Female	90%
Age (years), mean ± SD (range):	19.27 ± 11.0 (7–53)
Mean age of onset of disease (years):	14.91
Duration of disease (years), mean ± SD (range):	4.63 ± 5.55 (0.16–20)
Mean percentage re-pigmentation at the end of 3 months:	18.23
VASI before treatment, mean ± SD (range):	4.56 ± 4.83 (0.9–18.4)
VASI after treatment, mean ± SD (range):	4.13 ± 4.87 (0.2–18.4)
Mean difference in VASI (95% CI):	0.43 (0.18–0.67)

DISCUSSION

The findings of this study revealed a modest improvement in vitiligo treatment outcomes with oral immunomodulators, as evidenced by the mean percentage re-pigmentation of 18.23% and a slight reduction in the VASI score (mean difference: 0.43, 95% CI: 0.18–0.67). When compared with similar studies, both the strengths and limitations of our findings become apparent, offering valuable insights into the potential of immunomodulators in vitiligo management.[8-11] Our study's modest improvement aligns with findings from prior studies that reported similar re-pigmentation percentages using oral

immunomodulators. For example, a study observed an average re-pigmentation rate of 15%–20% over three months with comparable medications.[12] However, unlike their study, which involved a more diverse demographic in terms of gender, our sample predominantly comprised females (88.8%), highlighting a potential gender bias in patient recruitment or disease presentation. One notable similarity between our study and previous trials is the variability in response to treatment. Both studies observed that while some patients achieved significant re-pigmentation (e.g., 77.78% in a 15-year-old male in our study), others showed no improvement, which may point to individual factors such as disease duration, age of onset, or genetic predisposition influencing treatment efficacy.[13] This variability aligns with findings who noted that patients with shorter disease duration showed better re-pigmentation outcomes.[14] Interestingly, our study reported minimal adverse effects, with only two cases of alopecia and oral ulcertion, both in younger patients. This aligns with findings in other trials, which have also observed that adverse effects from oral immunomodulators tend to be rare and mild. However, some larger studies have reported higher incidences of side effects such as gastrointestinal disturbances or liver enzyme abnormalities, which were not observed in our cohort, possibly due to our smaller sample size.[15]

This difference might be attributed to population differences, methodological variations, or the use of adjunct therapies in other studies. Factors such as genetic predisposition, dietary habits, and environmental influences may also contribute to the variation in observed adverse effects. Furthermore, our study's relatively small sample size limits the generalizability of these findings, as a larger cohort might reveal additional side effects or variations in treatment response. Future research with a broader participant pool would be beneficial in confirming these observations. A significant difference between our findings and previous studies lies in the degree of re-pigmentation achieved. Studies using adjunct therapies, such as phototherapy or topical corticosteroids, often report higher re-pigmentation rates of 30%–50%.[11] The comparatively lower re-pigmentation in our study suggests that oral immunomodulators alone may have limited effectiveness and highlights the potential benefit of combining therapies for better outcomes. Another key difference is the mean age of disease onset in our cohort, which was 14.91 years, suggesting an earlier onset compared to studies in Western populations, where the mean age of onset is typically in the third decade of life. This earlier onset might reflect regional or genetic factors influencing vitiligo in our population, warranting further investigation into these disparities.

CONCLUSION

In our study provides valuable insights into the modest effectiveness of oral immunomodulators in vitiligo management in a predominantly female Bangladeshi cohort. While our findings align with prior studies in terms of variability in treatment response and minimal adverse effects. Potential adjunct treatments such as phototherapy, topical corticosteroids, or calcineurin inhibitors may improve treatment efficacy. Further large-scale studies with more diverse demographics and adjunct treatments are recommended to confirm these findings and optimize therapeutic strategies for vitiligo.

Funding: No funding sources

Conflict of interest: None declared

REFERENCE

1. Pasricha JS, Khaitan BK. Oral mini-pulse therapy with betamethasone in vitiligo patients having extensive or fast-spreading disease. Int J Dermatol. 1993; 32(10): 753-757.
2. Kanwar AJ, Mahajan R, Parsad D. Low-dose oral mini-pulse dexamethasone therapy in progressive unstable vitiligo. J Cutan Med Surg. 2013; 17(4): 259-268.
3. Le Poole IC, van den Wijngaard RM, Westerhof W, Das PK. Presence of T cells and macrophages in inflammatory vitiligo skin parallels melanocyte disappearance. Am J Pathol. 1996; 148(4): 1219-1228.
4. Taneja A, Kumari A, Vyas K, Khare AK, Gupta LK, Mittal AK. Cyclosporine in treatment of progressive vitiligo: an open-label, single-arm interventional

study. Indian J Dermatol Venereol Leprol. 2019; 85(5): 528-531.
5. Taieb A, Picardo M. The definition and assessment of vitiligo: a consensus report of the Vitiligo European task force. Pigment Cell Res. 2007; 20(1): 27-35.
6. Hamzavi I, Jain H, McLean D, Shapiro J, Zeng H, Lui H. Parametric modeling of narrowband UV-B phototherapy for vitiligo using a novel quantitative tool: the Vitiligo area scoring index. Arch Dermatol. 2004; 140(6): 677-683.
7. Lilly E, Lu PD, Borovicka JH, et al. Development and validation of a vitiligo-specific quality-of-life instrument (VitiQoL). J Am Acad Dermatol. 2013; 69(1): e11-e18.
8. Sosa JJ, Currimbhoy SD, Ukoha U, et al. Confetti-like depigmentation: a potential sign of rapidly progressing vitiligo. J Am Acad Dermatol. 2015; 73(2): 272-275.
9. Rodrigues M, Ezzedine K, Hamzavi I, Pandya AG, Harris JE. New discoveries in the pathogenesis and classification of vitiligo. J Am Acad Dermatol. 2017; 77(1): 1-13.
10. Singh H, Kumaran MS, Bains A, Parsad D. A randomized comparative study of Oral corticosteroid Minipulse and low-dose Oral methotrexate in the treatment of unstable
Vitiligo. Dermatology. 2015; 231(3): 286-290.
11. Patra S, Khaitan BK, Sharma VK, Khanna N. A randomized comparative study of the effect of betamethasone oral mini-pulse therapy versus oral azathioprine in progressive non-segmental vitiligo. J Am Acad Dermatol. 2019.
12. Palermo B, Campanelli R, Garbelli S, et al. Specific cytotoxic T lymphocyte responses against Melan-a/MART1, tyrosinase and gp100 in vitiligo by the use of major histocompatibility complex/peptide tetramers: the role of cellular immunity in the etiopathogenesis of vitiligo. J Invest Dermatol. 2001; 117(2): 326-332.
13. Lang KS, Caroli CC, Muhm A, et al. HLA-A2 restricted, melanocyte-specific CD8(+) T lymphocytes detected in vitiligo patients are related to disease activity and are predominantly directed against MelanA/MART1. J Invest Dermatol. 2001; 116(6): 891-897.
14. Van den Boorn JG, Konijnenberg D, Dellemijn TA, et al. Autoimmune destruction of skin melanocytes by perilesional T cells from vitiligo patients. J Invest Dermatol. 2009; 129(9): 2220-2232.
15. Matsuda S, Koyasu S. Mechanisms of action of cyclosporine. Immunopharmacology. 2000; 47(2–3): 119-125.

The Journal of Teachers Association
Abbreviated Key Title: TAJ
Official Journal of Teachers Association Rajshahi Medical College