Section: Dermatology

Original Research Article

COMPARATIVE STUDY OF EFFICACY OF PUVASOL VS TOFACITINIB IN PALMOPLANTAR PSORIASIS

P. Krishna Priya[1], Farzana Md[2], Kollipara Haritha[3], Rahul Ray[4], B.V. Ramachandra[5]

[1]Consultant, Department of Dermatologist, Visakhapatnam, Andhra Pradesh, India.
[2]Associate Professor, GITAM Institute of Medical Sciences and Research (GIMSR), Visakhapatnam, Andhra Pradesh, India.
[3]Associate Professor, GIMSR, Visakhapatnam, Andhra Pradesh, India.
[4]Professor & HOD, GIMSR, Visakhapatnam, Andhra Pradesh, India.
[5]Professsor & HOD (Retd), GIMSR, Visakhapatnam, Andhra Pradesh, India

Received : 08/07/2025
Received in revised form : 22/08/2025
Accepted : 15/09/2025

Keywords:
Palmoplantar psoriasis, Tofacitinib, PUVAsol, MPASI, DLQI.

Corresponding Author:
Dr. P. Krishna Priya,

DOI: 10.47009/jamp.2025.7.5.128

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (5); 662-668

ABSTRACT

Background: Palmoplantar psoriasis is a chronic, debilitating variant constituting 3–4% of psoriasis cases. Characterized by erythema, hyperkeratosis, scaling, and fissuring, it greatly impairs quality of life. While Tofacitinib has shown efficacy in chronic plaque psoriasis, evidence in palmoplantar psoriasis remains limited. Various therapies, from topical steroids to systemic immunosuppressives and biologics, have been tried, but achieving complete clearance and long-term remission remains difficult. The aim and objective are to compare the efficacy and safety of oral PUVAsol and systemic Tofacitinib in palmoplantar psoriasis using MPASI (modified psoriasis area severity index) and DLQI (dermatology life quality index) scores. **Materials and Methods:** A total of 40 patients with palmoplantar psoriasis were randomized into two groups. Group A received oral Tofacitinib 5 mg BD for 3 months, while Group B received 8MOP 20 mg on alternate days followed by sun exposure (5–15 min) after 2 hours, for 3 months. Assessments were performed every 4 weeks with clinical photographs, MPASI, and DLQI scores. **Result:** The mean age was 44.11±12.34 (Group A) and 46.25±9.88 (Group B), with female preponderance. Mean disease duration was longer in Group A (47.75±40.37 vs 28.60±28.60 months). At 3 months, Group A showed significantly greater reduction in MPASI (47.75±23.31 to 1.65±2.08) compared with Group B (46.35±24.32 to 12.60±13.61) (p=0.001). DLQI improvement was also superior in Group A (14.24±4.47 to 0.00) compared with Group B (14.30±15 to 3.90±3.93) (p=0.001). Complete (100%) MPASI clearance was achieved in 40% of Group A patients, but none in Group B. Early and sustained lesion resolution was observed in Group A. No major adverse effects occurred in either group. **Conclusion:** Both Tofacitinib and PUVAsol were effective in palmoplantar psoriasis; however, Tofacitinib demonstrated significantly higher efficacy with rapid remission, complete clearance in a subset, and greater improvement in quality of life. PUVAsol remains a cost-effective alternative but failed to achieve early remission or complete clearance. Larger studies are required to assess the long-term safety of systemic Tofacitinib, and prolonged PUV Asol therapy warrants monitoring for risk of non-melanoma skin cancers.

INTRODUCTION

Psoriasis is a complex multisystemic inflammatory papulosquamous disorder characterized by well-demarcated elevated erythematous to hyperpigmented plaques with silvery white micaceous scaling.[1] Prevalence of psoriasis is 2 -4% globally.[2] In India, it is variable in different geographic locations due to the complex interplay between genetic and environmental factors. Pathogenesis is multifactorial with a hallmark of sustained inflammatory response leading to aberrant keratinocyte proliferation and differentiation which is primarily driven by T cells, particularly Th17, along with various cytokines like TNF-α, IL-17, and IL-23.[3]

The clinical presentation of psoriasis includes morphological variants which consist of psoriasis vulgaris, guttate psoriasis, pustular psoriasis, erythrodermic psoriasis, and psoriatic arthritis. Based on sites of involvement localized types include flexural, scalp, palmoplantar, and nail psoriasis.[4]

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Of these, Palmoplantar psoriasis is a chronic debilitating variant characterized by erythema, hyperkeratosis, scaling, fissuring, and bleeding which accounts for 3-4% of all cases of psoriasis significantly impairing quality of life.[5,6] There are many therapeutic modalities with no standardized treatment and the relapsing and remitting nature of the disease further aggravated by daily friction makes it a challenging condition to treat.[7] Topical treatment as monotherapy is preferred in mild disease but is often ineffective due to the thick stratum corneum of palms and soles.[8] Patients with moderate or severe disease and those not responding to topicals may require phototherapy (NBUVB, PUVA, PUVAsol) or systemic medications (methotrexate, cyclosporine, oral retinoids, biological),[7] But most of the treatment modalities fail to provide early and long-term remission in palmoplantar psoriasis. Recently, small molecule drugs like Tofacitinib were found effective and have shown promising results in psoriasis management.[9]

In our study, an attempt has been made to compare the conventional PUVAsol therapy with systemic Tofacitinib, a newer emerging therapy for psoriasis. PUVAsol is the oral intake of Psoralen followed by exposure to sunlight which was used successfully for the treatment of psoriasis.[10] Tofacitinib, a Janus kinase (JAK) inhibitor, blocks the JAK-STAT pathway, inhibiting the expression of IL17, IL-22, and IL-23.[9] This study aims to compare the clinical efficacy and safety of PUVAsol vs systemic Tofacitinib in Palmoplantar psoriasis.

MATERIALS AND METHODS

A comparative, non – randomized prospective interventional study was conducted on patients with palmoplantar psoriasis in a tertiary care center. Institutional ethics committee clearance was obtained prior to the study. The study period was from August 2022 to April 2024.

Selection of patients was done based on following inclusion and exclusion criteria

Inclusion Criteria

Patients of both sexes, aged 18-70 years clinically diagnosed as palmoplantar psoriasis

Exclusion Criteria

Patients <18 years or >70 years of age. Patients prone to extreme friction of palms and soles (manual laborers) and patients with any known photosensitive dermatosis were excluded. Patients with a history of active infections, malignancy, cardiac disease, pregnancy and lactation. Patients with deranged CBC, LFT, RFT parameters.

Methodology

- 68 patients of Palmoplantar psoriasis were recruited for the study. All patients were informed about the nature and course of the disease, benefits, and possible side effects of the treatment they would receive.
- Written informed consent was obtained from all the patients before initiation of treatment.
- Demographic data was recorded, and a complete history was obtained. General, systemic, and ophthalmological examinations were performed, along with a thorough dermatological assessment. Findings were recorded in a standardized proforma.
- Baseline MPASI and DLQI scores were calculated for all patients. Lesional biopsies were performed in a few cases for confirmation of diagnosis.
- Patients were randomly assigned to two groups: Group A received oral tofacitinib, and Group B received oral PUVAsol.
- Out of 68 enrolled patients, 28 were excluded due to various reasons. The study was completed by 40 patients, with 20 patients in each group.

Treatment Regimens

Group A: Received systemic Tofacitinib 5mg BD for 3 months

Group B: Received oral PUVAsol (8MOP) 20mg two hours before sun exposure every alternate day, followed by exposure to sunlight for 5-15 minutes for 3 months.

- Patients in both groups were given liquid paraffin, and those with severe pruritus were prescribed antihistamines.
- Clinical photographs were taken using a phone camera ( ) at the baseline and monthly intervals for 3 months.
- Patients were assessed for treatment response and side effects.
- MPASI (modified psoriasis area severity index) and DLQI (dermatology life quality index) were recorded at 4 weeks, 8 weeks and 12 weeks.
- CBC, LFT, RFT, lipid profile, and urine analysis were repeated at 1 month and at 12 weeks.
- Modified PASI = Area involved x (erythema + scaling + induration +fissuring).

The lesions on the palms and soles were graded separately for erythema, scaling, induration, and fissuring on a 5-point scale

- 0 - Absent
- 1 - Mild or minimal
- 2 - Moderate
- 3 - Severe
- 4 - Very severe

The percentage of surface area affected was also graded as

- GI-0-20% involvement
- GII-20-40%
- GIII-40-60%
- GIV:60-80%
- GV:90-100%

Statistical analysis: In this study, statistical analysis was performed using Microsoft Excel 2016.

All the quantitative variables were expressed as mean +/- standard deviation and evaluated using an unpaired T-test. Qualitative data was analysed with the help of the chi-square test. P value <0.05 was considered statistically significant.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

RESULTS

This comparative interventional study was done on 40 patients, where 20 patients each were recruited into two groups and results were tabulated based on age, sex, duration of disease, comorbidities, occupational distribution, and other associations. Treatment efficacy was assessed by comparing MPASI and DLQI across the two groups.

In group A (systemic tofacitinib) there were 8 males and 12 females, and in group B (oral PUVAsol) there were 4 males and 16 females.

The mean age of presentation was almost the same in both groups, with both groups showing female preponderance. The duration of the disease was comparatively longer in group A than in group B. The most common comorbidity association was hypertension in group A and type II diabetes in group B. The history of seasonal variation and psychological stress was almost similar in both groups. Positive family history was seen in two cases of group A and one case of group B. Nail involvement was seen in only one patient in group B.

Table 1: Demographic Data

Characteristics	Group A(n=20)	Group B(n=20)	P value
Age-Mean (yr)	44.11±12.34	46.25±9.88	0.548
Age-yr- n (%)			
21-40	9(45)	7(35)	0.518
41-60	9(45)	12(60)	0.342
>61	2(10)	1(5)	0.548
Gender n (%)			
Male	8(40)	4(20)	0.167
female	12(60)	16(80)	0.167
Duration of illness(months)	47.75±40.37	28.60±28.60	0.09
Symptoms			
Itching	20(100)	20(100)	-
pain	7(35)	4(20)	0.288
Comorbidities n (%)			
T2DM	7(35)	8(40)	0.744
HTN	10(50)	6(30)	0.196
Thyroid D/O	2(10)	3(15)	0.632
H/O seasonal variation n (%)	10(50)	9(45)	0.751
H/o psychological stress n (%)	8(40)	7(35)	0.744
Family H/o n (%)	2(10)	1(5)	0.548
Nail involvement	-	1(5)	0.311

Note: The above quantitative variables were expressed as mean ± standard deviation and comparison of groups were made using unpaired t test. T2DM- type II diabetes, HTN-hypertension

Occupations related to daily friction were most commonly affected in palmoplantar psoriasis but occupations not related to friction were also affected almost equally.

57.5% of patients were occupationally prone to friction, the majority of them being homemakers while 42.5% were not associated with frictional work.

Table 2: Occupational distribution

Nature of occupation	Occupation	No.(%)
Related to friction	Home maker	22(55)
	Car driver	1(2.5)
Not related to friction	Others	17(42.5)

Table 3: Reduction of mean MPASI

Group	Baseline mean MPASI	4 Weeks mean MPASI	8 Weeks mean MPASI	12 Weeks mean MPASI	P value
A(n=20)	47.75±23.31	21.45±18.45	7.70±7.91	1.65±2.08	0.001
B(n=20)	46.35±24.32	28.85±16.49	19.15±15.87	12.60±13.61	0.001

Note: The above quantitative variables were expressed as mean ± standard deviation and the comparison between groups was done using an unpaired T test. MPASI-modified psoriasis area severity index

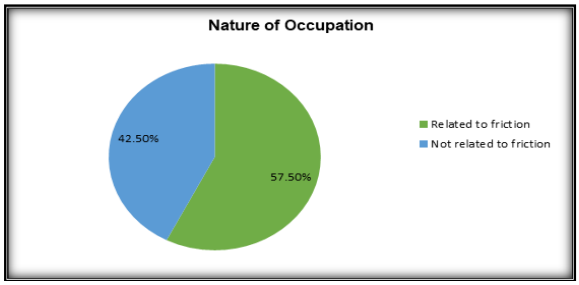

Figure 3: Occupational distribution

Note: 57.5% of study population represent occupation related to friction.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

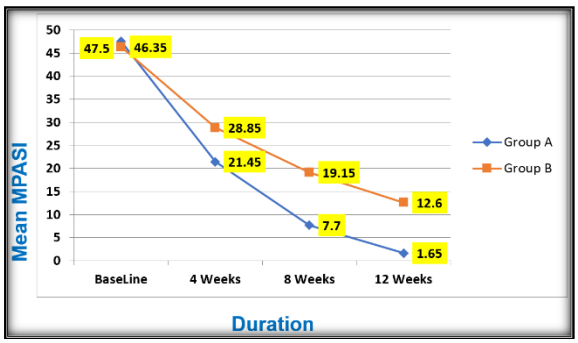

Figure 4: Reduction of mean MPASI

Note: The reduction in mean MPASI was rapid in group A compared to group B

The mean MPASI reduced significantly from baseline to the end of 12 weeks which was statistically significant.

In group A all 20 patients showed 76-100 % improvement in MPASI. In group B only 11 patients showed 76-100% improvement with 2 patients each showing less than 25% and 25-50% improvement in MPASI.

Table 4: Improvement in MPASI at the end of treatment (%)

Group	Percentage Of Patients Showing Improvement			
	<25%	26- 50%	51- 75%	76-100%
A (n=20) n (%)	-	-	-	20(100)
B(n=20) n (%)	2(10)	2(10)	5(25)	11(55)

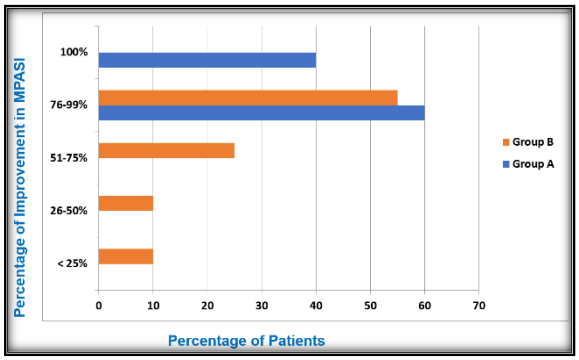

Figure 5: Improvement at the end of treatment

Note: 40% of patients in group A showed 100% improvement in MPASI while none of the patients in group B showed complete 100% improvement. In group A 60% of patients showed 76-99% improvement in MPASI while 55% of patients in group B showed 76-99%improvemnet in MPASI.

In group A there was a rapid reduction in DLQI score within one month of the start of treatment with a complete reduction of score to zero by the end of 12 weeks. In group B also there was significant reduction in DLQI scores from baseline to the end of 12 weeks which was comparatively less than in group A.

Table 5: Mean change in DLQI

Group	At Baseline	4 Weeks	8 Weeks	12 Weeks	P value
A(n=20)	14.24±4.47	2.9±2.25	0.4±0.68	0.00	0.001
B(n=20)	14.30±5.15	9.70±4.44	6.15±4.11	3.90±3.93	0.001

Note: The above quantitative variables are expressed as mean ± standard deviation and the comparison between groups was done using an unpaired T-test. DLQI-dermatology life quality index

Table 6: Adverse effects

Adverse effects	Group A (n=20)	Group B (n=20)
Diarrhea no. (%)	1(5)	-
Wheals	1(5)	-
Folliculitis	1(5)	-
Gastritis	1(5)	2(10)
Headache	-	1(5)
Nausea	-	1(5)
Pigmentation	-	3(15)
Total	20	35

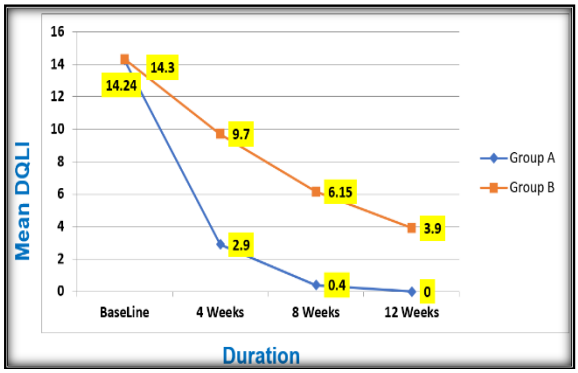

Figure 6: MEAN CHANGE IN DLQI

Note: The mean change in DLQI was rapid in group A compared to group B

The percentage of patients who reported side effects was more in Group A compared to Group B

ISSN (O): 2687-5365; ISSN (P): 2753-6556

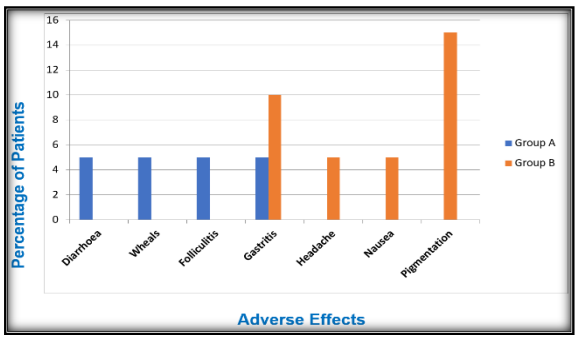

Figure 7: Adverse effects

Note: Gastrointestinal symptoms like gastritis were common in both groups.

Out of 40 cases of the study population, 22 doubtful cases were subjected to lesional biopsy and their findings were noted. Predominantly hyperkeratosis, parakeratosis, and regular elongation of rete ridges were seen. A few cases also showed munro's microabscess and spongiform pustules of kojog.

Histopathological findings

Histological features	**N=22 n (%)**
1. Hyperkeratosis	20(90.9)
2. Parakeratosis -Focal -Confluent	4(18.1) 18(81.8)
3. Munros microabscess	2(9)
4. Diminished or Absent granular layer	5(22.7)
5. Acanthosis -Regular -Irregular	 3(13.6) `9(40.9
6.Spongiosis -Focal -Moderate	 14(63.6) 2(9)
7.Spongiform pustule of kojog	5(22.7)
8. Regular elongation of rete ridges	20(90.9)
9. Irregular elongation of rete ridges	2(9)
10. Suprapapillary thinning	6(27.2)
11. Dilated and congested blood vessels	2(9)
12. Infiltrate (Lymphocytic) -Perivascular -Periadnexal	 11(50) 3(15)

Histopathological images

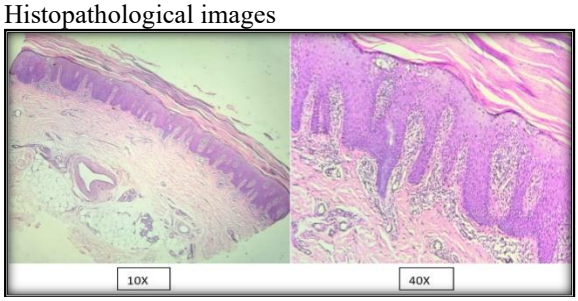

Figure 8: Case 1

Note: Hyperkeratosis, confluent parakeratosis, focal spongiosis, regular elongation of rete ridges, periadnexal and perivascular lymphocytic infiltrate seen.

4 cases in group A were followed up post-treatment and none of the patients reported recurrence immediately after stoppage of therapy and long lasting remission upto 3-4 months was observed. Whereas of 3 cases who were followed up in Group B, all patients had recurrences within 1-3 weeks of stoppage of therapy.

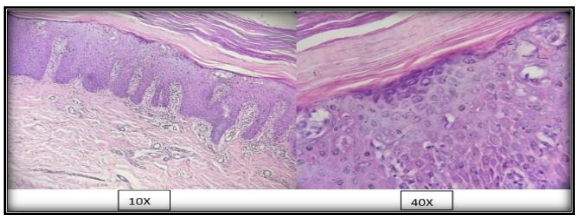

Figure 9: Case 2

Note: Compact hyperkeratosis with focal parakeratosis, hypogranulosis, moderate spongiosis, spongiform pustules of kojog, and regular elongation of rete ridge seen.

Follow-up after scheduled therapy:

Duration of follow-up	**Group A (N=4) No. (%)**	**Group B (N=3) No. (%)**
Within 1 week	-	1 (33.3)
2-4 weeks.	-	2 (66.6)
5-8 weeks	-	-
9-12 weeks	1 (25)	-
13-16 weeks	3 (75)	-

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Case 1

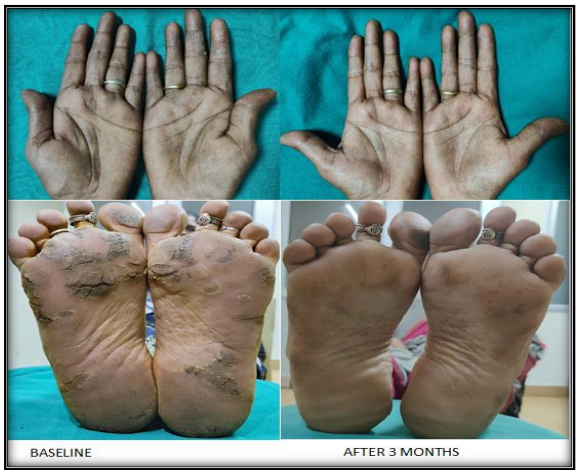

Figure 10: Clinical Images - Group A

Case 2

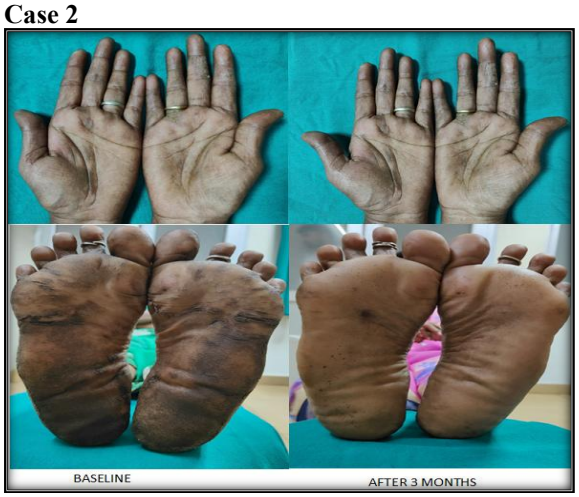

Figure 11: Clinical Images - Group A

Case 1

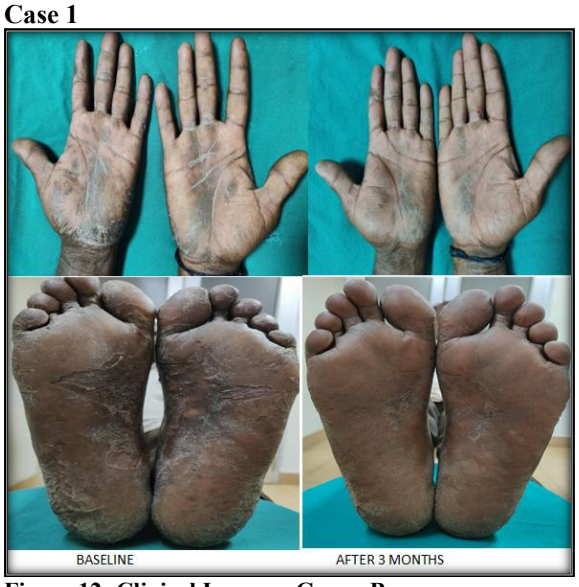

Figure 12: Clinical Images - Group B

Case 2

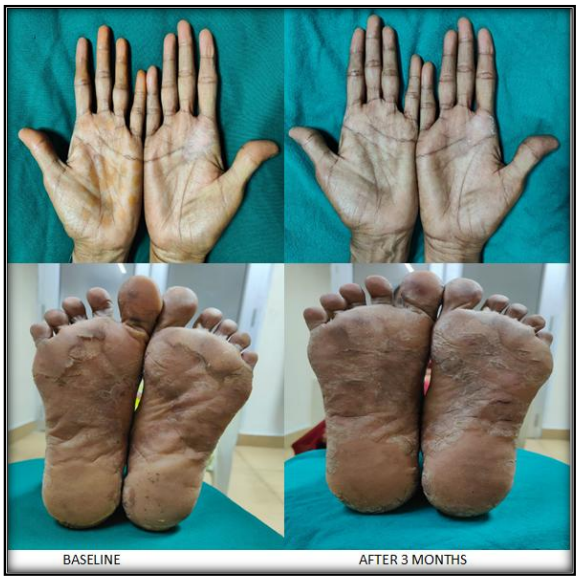

Figure 13: Clinical Images- Group B

DISCUSSION

Palmoplantar psoriasis is a chronic, disfiguring dermatosis of palms and soles with significant psychological and quality-of-life impact. Although several treatment options exist, none have been completely effective in sustaining remission.[11]

This study analyzed 40 patients treated with systemic Tofacitinib and oral PUVAsol. The predominant age group affected was 41–60 years (52.5%), similar to Suman Babu P. S et al. Mean ages were 44.11±12.34 (Group A) and 46.25±9.88 (Group B). Female preponderance was noted (70%), correlating with Perumal et al, though some studies reported male dominance or equal distribution. Occupational friction was observed in 57.5% patients, mostly homemakers, similar to previous studies. Exposure to detergents likely contributed to aggravation.[12-18]

All patients had itching, consistent with Sampogna et al and others. Fissuring with pain affected 55%, sometimes with secondary infection. Winter exacerbation was noted in 47.5% cases, resembling findings by Khandpur S et al. Psychological stress (37.5%) influenced disease, as also reported by Manolache L et al. Nail involvement was rare (1 patient), contrasting with higher prevalence (41%) in Khandpur's study.[19-21]

Histopathology commonly revealed hyperkeratosis, parakeratosis, elongated rete ridges, and perivascular lymphocytes. Similar results were described by Broggi G et al and Rao A et al.

Systemic Tofacitinib has shown efficacy in plaque psoriasis, with limited studies in palmoplantar psoriasis. Muzumdar S et al demonstrated significant improvement with Tofacitinib, consistent with our findings. Data on oral PUVAsol in palmoplantar psoriasis remain sparse, with most studies evaluating topical PUVA. In plaque psoriasis, Gahalaut P et al reported high response rates with oral PUVAsol.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

In our study, mean MPASI declined from 47.75±23.31 to 1.65±2.08 in Tofacitinib group and from 46.35±24.32 to 12.60±13.61 in PUVAsol group. Reduction was more rapid and significant with Tofacitinib (p=0.001). At study end, Group A achieved 96.5% reduction vs 72.8% in Group B. Compared with Hassanandani T et al, where Methotrexate+Apremilast achieved 72.1% reduction and Methotrexate alone 39.8%, our results showed greater efficacy with Tofacitinib. Notably, 100% MPASI clearance was achieved in 40% of our Group A patients, while none in Group B achieved this. Compared with older systemic agents, Tofacitinib showed better outcomes than Methotrexate and Acitretin.

DLQI scores also improved significantly: Group A from 14.24±4.47 to 0.00, Group B from 14.30±5.15 to 3.90±3.93, with faster reduction in Group A. Reduction was comparable to Hassanandani T et al though achieved earlier with Tofacitinib.

Adverse effects were minimal. In Group A, 5% each reported diarrhea, wheals, gastritis, and folliculitis. Group B presented with pigmentation (15%) and mild GI effects. Headache was seen in one patient (5%). In terms of remission, Group A patients maintained clearance up to 3–4 months post-therapy, whereas Group B relapsed within 1–3 weeks.

CONCLUSION

Both systemic Tofacitinib and oral PUVAsol are effective treatments for palmoplantar psoriasis, significantly reducing disease severity and improving quality of life. Tofacitinib demonstrated superior efficacy with faster, more complete lesion clearance and longer remission compared to PUVAsol. While PUVAsol is a cost-effective option, it achieved less rapid improvement and incomplete clearance. Minimal side effects were observed with both treatments. Larger studies are needed to confirm long-term safety and efficacy of systemic Tofacitinib. Additionally, extended monitoring is required to assess the risk of skin cancer with prolonged PUVAsol use. Overall, Tofacitinib offers a promising therapeutic option for this challenging condition.

REFERENCES

1. Dogra S, Uadeya A. Psoriasis: Epidemiology, clinical features, comorbidities and diagnosis. Indian J Dermatol Venereol Leprol. 2016;82(3):237-246.
2. Parisi R, Symmons DP, Griffiths CE, Ashcroft DM. National, regional, and worldwide epidemiology of psoriasis: systematic review and meta-analysis. Br J Dermatol. 2020;184(1):5-19.
3. Lowes MA, Suarez-Fariñas M, Krueger JG. Immunology of psoriasis. Annu Rev Immunol. 2014;32:227-255.
4. Garakani A, Smoller BR. Clinical variants of psoriasis. Dermatol Clin. 2010;28(3):343-354.
5. Broggi G, Perlini C, Franchi A, et al. Palmoplantar psoriasis: A clinico-pathologic study of 21 patients. J Cutan Pathol. 2022;49(3):276-283.
6. Sampogna F, Tabolli S, Abeni D. Quality of life and clinical severity in patients with different types of psoriasis. Dermatology. 2005;210(1):35-40.
7. Dogra S, Bhardwaj R, Thami G. Treatment challenges in palmoplantar psoriasis: An update. Indian Dermatol Online J. 2016;7(2):140-146.
8. Bhatia A, Sharma V. Palmoplantar psoriasis: Clinical evaluation and topical therapies. Indian J Dermatol Venereol Leprol. 2015;81(5):503-509.
9. Wang T, Yin X, Zhang L, et al. Tofacitinib treatment for plaque psoriasis and psoriatic arthritis: A meta-analysis of randomized controlled trials. Dermatol Ther. 2025;35(1):e15678.
10. Maruani A, Ortonne JP, Bousquet PJ. Oral PUVAsol in the treatment of psoriasis. Dermatology. 2014;228(4):345-350.
11. Suman Babu PS, Verma R, Mahajan BB. Epidemiological and clinical aspects of palmoplantar psoriasis in Indian patients. Indian J Dermatol. 2022;67(5):358-364.
12. Perumal J, Srinivas CR, Vazhayil V, et al. Clinical and epidemiological characteristics of palmoplantar psoriasis patients in South India. J Clin Diagn Res. 2018;12(4):WC01-WC04.
13. Khandpur S, Sharma VK. Clinical profile and association of risk factors in psoriasis patients. Indian J Dermatol Venereol Leprol. 2010;76(5):540-546.
14. Manolache L, Buchvald C. The impact of psychological stress on dermatological disorders. Eur J Dermatol. 2010;20(6):766-772.
15. Muzumdar S, Behlekar A, Khopkar U. Efficacy of tofacitinib in palmoplantar psoriasis: Case series and review. Indian J Dermatol Venereol Leprol. 2023;89(2):208-213.
16. Gahalaut P, Garg VK. Efficacy of oral PUVAsol in chronic plaque psoriasis: A clinical study. Indian J Dermatol. 2018;63(3):207-211.
17. Hassanandani T, Malhotra SK, Sharma VK. Comparison of methotrexate plus apremilast versus methotrexate in palmoplantar psoriasis: A randomized controlled trial. Indian J Dermatol Venereol Leprol. 2020;86(5):560-565.
18. Parasam SB, George S, Paul TV. Systemic therapies in psoriasis: Methotrexate and acitretin efficacy. Indian J Dermatol Venereol Leprol. 2016;82(2):154-160.
19. Broggi G, Peris K, Ingordo V. Histopathological features of palmoplantar psoriasis. J Cutan Pathol. 2022;49(4):350-357.
20. Rao A, Panda S, Rajagopal R. Histology and clinical correlation in palmoplantar psoriasis: A study of 31 cases. Indian J Dermatol. 2019;64(6):435-440.
21. Hassanandani T, Malhotra SK, Sharma VK. Impact of methotrexate and apremilast on quality of life in palmoplantar psoriasis: DLQI outcomes. Indian J Dermatol Venereol Leprol. 2020;86(7):700-705.

ISSN (O): 2687-5365; ISSN (P): 2753-6556