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UNTANGLING THE SOCIO-ECONOMIC KNOT OF PSORIASIS TREATMENT: A QUEST FOR EQUITY

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Abstract

Introduction: Psoriasis, a chronic and multifactorial condition impacting 1–3% of the global population, is emerging as more than just a singular ailment. Recent advancements in understanding the pathophysiology of psoriasis have paved the way for the development of these more precise treatments. The financial toll of psoriasis, including expenses for medical consultations, treatments, loss of career productivity places a considerable burden on patients and society. Furthermore, the influence of skin diseases on treatment decisions underscores the need for comprehensive evaluation. **Objective:** This study was conducted to correlate the treatment affordability, therapeutic response, treatment adherence and quality of life among patients of various socio-economic statuses. **Methodology:** A prospective cross-sectional study was conducted at the Dermatology department in Tertiary Care Hospital among 95 adult psoriasis patients who received systemic treatment (phototherapy, traditional oral/injectable systemic agents, or biologics) between January 2023 and December 2023. A pre-tested semi-structured questionnaire was used and clinical response to treatment based on improvement was assessed using Psoriasis Area and Severity Index (PASI). **Results:** The mean age of psoriasis patients was 39.44 ±12.7 years. Most of the psoriasis patients belonged to lower middle class (33.7%). Only 8(8.4%) have taken biologicals as a treatment for psoriasis. Majority took methotrexate (48.4%) as treatment followed by Apremilast (16.8%). Only 16 (16.7%) were nonadherent to treatment. There was a significant association between the treatment taken and socioeconomic status (pvalue<0.05). **Conclusion:** Non biologicals had more non adherence as compared to biologicals. Higher the socioeconomic status more is the treatment adherence. Also higher socioeconomic class opted for biological treatment. By fostering a collaborative partnership and empowering patients, these guidelines helps to mitigate the risk of nonadherence and suboptimal clinical outcomes.

Keywords: Biologics, Compliance, Psoriasis, Socio-Economic Status.

INTRODUCTION

Psoriasis, a chronic and multifactorial condition impacting 1–3% of the global population, is emerging as more than just a singular ailment; it is increasingly recognized as a syndrome with significant associated health issues.[1,2] India has a Disability adjusted Life in years (DALY) of 115 for psoriasis among all asian countries whose DALY ranged form 1 -195. [3] Its onset, often before the age of 30, coincides with the most productive years of an individual's life, magnifying its societal and personal impact.[4]

The development of psoriasis is characterized by intricate interplays among genetic, immunological, and environmental elements, resulting in aberrant immune reactions and the excessive proliferation of keratinocytes.[5] Though multi-factorial, genetical makeup plays a primary contributor role especially in those with early-onset plaque psoriasis.[6] Psoriasis management encompasses a variety of treatments, including topical agents such as vitamin D analogues and corticosteroids, phototherapy involving narrowband ultraviolet B radiation (NB-UVB) and psoralen and ultraviolet A radiation (PUVA), as well as systemic therapies like methotrexate, ciclosporin, and

acitretin. Additionally, biologic treatments targeting specific molecules such as tumor necrosis factor (TNF), interleukin (IL)-17, and IL-23 inhibitors, as well as small molecule inhibitors like dimethyl fumarate and apremilast, offer highly effective and targeted approaches. Recent advancements in understanding the pathophysiology of psoriasis have paved the way for the development of these more precise treatments.[6]

With spectrum of treatment options available, poor fit to treatment recommended lead to dissatisfaction among patients thereby contributing to low adherence level and hence altering the outcome of disease severity. [7] Also preferences" can be understood as a fundamental economic concept highlighting the significance of individual valuation in decision-making scenarios.[8]The financial toll of psoriasis, including expenses for medical consultations, treatments, and the loss of career productivity, places a considerable burden on both patients and society. Furthermore, the influence of skin diseases on treatment decisions underscores the need for comprehensive evaluation. [1]

Hence this study was conducted to to correlate the treatment affordability, therapeutic response, and quality of life among patients of various socio-economic statuses. Thus it aids in developing targeted interventions to ensure equitable access to effective psoriasis treatment.

METHODOLOGY

A prospective cross-sectional study was conducted at the Dermatology department in Saveetha Medical College and Hospital among psoriasis patients between January 2023 and December 2023. All patients aged 18 years or older diagnosed with psoriasis who received systemic treatment (phototherapy, traditional oral/injectable systemic agents, or biologics) during the study period were included. A sample of 95 was obtained by taking the prevalence of psoariasis patients who belonged to Upper lower socioeconomic status from a study done in Mangalore[9] P = 33.4%, Absolute precision of 10, 10% Nonresponse rate. (Open Epi Software).

Demographic details such as age, gender, socio-economic status and clinical data including, psoriasis history, disease severity, treatments used and response, and comorbidities were obtained from the patients after getting written informed consent. Modified Kupuswamy scale 2023[10] was used to assess the socio-economic status.

The study protocol was reviewed and approved by the Institutional Review Board. The main outcome variables were 1) type of treatment prescribed, 2) clinical response to treatment based on improvement using Psoriasis Area and Severity Index (PASI)score.

PASI was calculated by scoring the lesion for erythema, induration, and desquamation. It also considered the area of the body affected by psoriasis.[11]The severity of PASI score was graded as mild, moderate, and severe with scores of <5, 5–10, and >10, respectively.

Data was analyzed using statistical software SPSS version 23. Descriptive statistics like Frequency and percentage, mean and standard deviation were computed for categorical variables and continuos variables. Chi square test was used to find association between socioeconomic status and treatment outcome.

RESULTS

The mean age of psoriasis patients was 39.44 ±12.7 years. The minimum age was 18 years and the maximum was 73 years. Most of the patients were males (60%). Most of the psoriasis patients belonged to lower middle class (33.7%) followed by upper lower class (29.5%).(Table 1)

Table 1: Distribution of patients according to Socio-economic status

Socio-economic status	Frequency	Percent(%)
Upper	10	10.5
Upper Middle	15	15.8
Lower Middle	32	33.7
Upper Lower	28	29.5
Lower	10	10.5

The majority of patients had plaque psoriasis (73.7%). (Figure 1). Psoriatic arthritis was present in 16 patients. (16.8%). The mean duration of the disease was 3 ± 2.5 yrs. The minimum duration was 1 year and the maximum was 20 years.

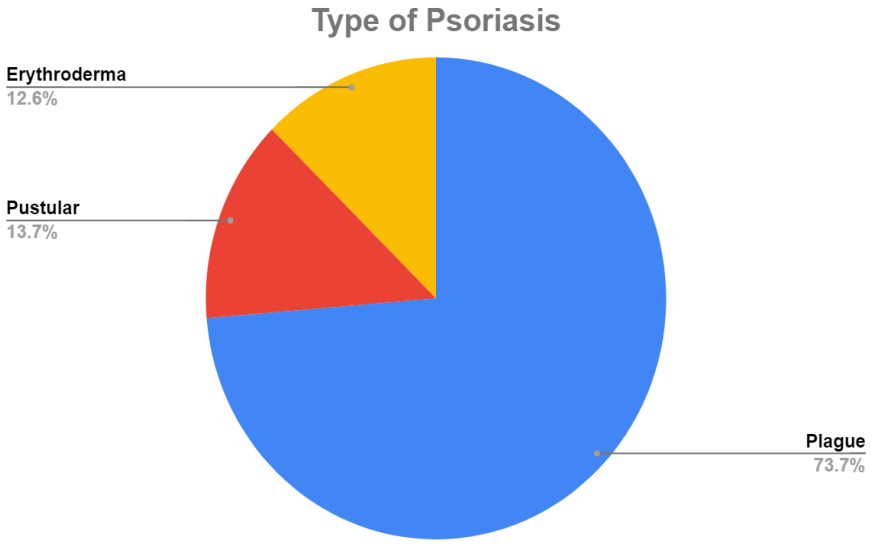


Figure 1: Type of Psoriasis

Only 8(8.4%) have taken biologicals as a treatment for psoriasis. The remaining 87 (91.5%) have taken Non-biologicals as treatment. Majority took methotrexate (48.4%) as treatment followed by Apremilast (16.8%). (Table 2). Only 16 (16.7%) were nonadherent to treatment. All the patients who took biologicals were adherent to treatment. 25% who took Acitretin and 17.3% who took methotrexate were nonadherent. (p-value not significant). Patients who belonged to upper socieconomic class were all adherent to treatment as comapred to other class. ($p<0.05$). (Table3)

Table 2: Treatment Taken

Treatment Taken	Frequency	Percent %
Biologicals	8	8.4
Methotrexate	46	48.4
Acitretin	12	12.6
Tofacitnib	13	13.7
Apremilast	16	16.8
Total	95	100

Table 3: Treatment Adherence and related factors

S.No	Variable	Not Adherent n=16	Adherent n=79	Total N=95	P value
1	**Treatment Taken**				
	Biologicals	0 (0%)	8 (100%)	8	0.688
	Methotrexate	8 (17.3%)	38 (82.7%)	46	
	Acetretin	3 (25%)	9 (75%)	12	
	Tofacitnib	2 (15.3%)	11 (84.7%)	13	
	Apremilast	3 (18.7%)	13 (81.3%)	16	
2	**Socio-Economic Status**				
	Upper	0 (0%)	10 (100%)	10	**0.26***
	Middle	5 (10.6%)	42 (89.4%)	47	
	Lower	11 (29%)	27 (71%)	38	

***Pvalue significant <0.05. P value obtained from Chi square test**

Based on the Psoriasis Area and Severity Index (PASI)score irrespective of treatment received, the number of patients in mild disease had increased after treatment accompanied by a reduction in the number of patients in Moderate and severe disease severity. P value <0.05. The distribution based on treatment category is also shown in table4.

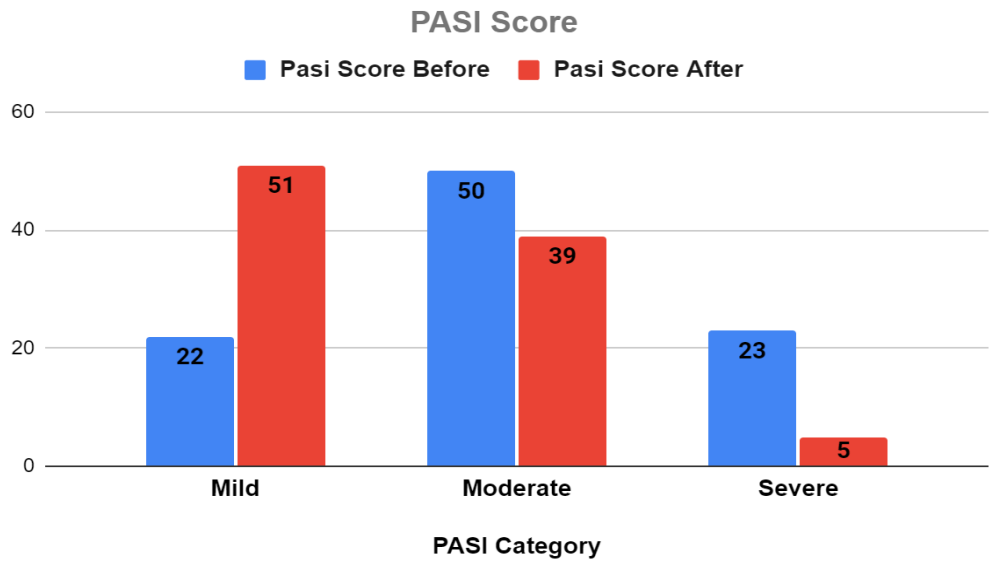


Figure 2: PASI Category Before and After Treatment

Table 4: Treatment Taken and PASI Disease Severity Category

Treatment Taken	Mild		Moderate		Severe	
	Before	After	Before	After	Before	After
Biological n=8	0	6	2	2	6	0
Methotrexate n= 46	9	23	24	20	13	3
Acetretin n= 12	5	6	6	5	1	1
Tofacitnib n=13	6	9	7	4	0	0
Apremilast n=16	2	7	11	8	3	1

Psoriasis patients who belonged to upper class preferred biologicals as treatment modality. Majority of patients in middle class has taken methotrexate followed by Apremilast. (p<0.05). There was no significant association of age and gender with treatment taken. (Table5).

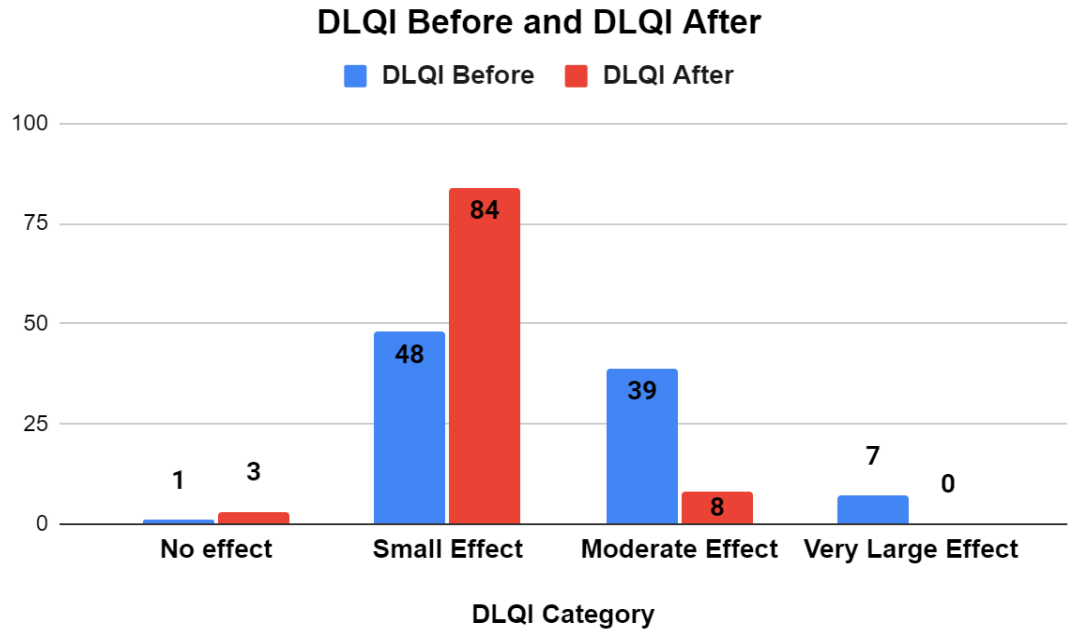
Table 5: Association between SES and Treatment taken

S.No	Variable	Treatment Taken						P value
		Biological n=8	Methotrexate n=46	Acetretin n=12	Tofacitnib n=13	Apremilast n=16	Total N = 95	
1	**SES**							
	Upper	8	1	0	1	0	10	**0.00***
	Middle	0	18	8	10	11	47	
	Lower	0	27	4	2	5	38	
2	**Age**							
	≤35yrs	1	25	5	4	5	40	0.12
	>35yrs	7	21	7	9	11	55	
3	**Gender**							
	Male	3	20	2	8	5	38	0.19
	Female	5	26	10	5	11	57	

P VALUE <0.05 IS Statistically significant

DLQI Score

The number of patients who has a small effect on quality of life due to psoriasis had increased after treatment and the number of patients who had moderate and very large effect had decreased after treatment.



DISCUSSION

The present study included 95 patients with psoriasis. The mean age of psoriasis patients in our study was 39.4 yrs. The mean age was higher in studies done by Nayak PB et al 44 yrs[9] and by Mathew TL et al 48 yrs.[12] Male preponderence was obsereved in present study and the findings were consistent with other studies conducetd all over Asia.[9,12,13] Female preponderence have been reported from studies in India among

peditraic psoriasis patients.[14,15.] The majority of psoriasis patients atttending our OPD belonged to lower middle class 33.7% followed by upper lower class 29.5%. Only 10.5% belonged to upper class. Whereas a study done in by Preeti B et al[9] showed that majority belonged to upper middle class and only 2% belonged to upper class. Another study done by Joseph et al[16] majority belonged to lower lower class 52% followed by lower middle class 20%. As compaed to our study, there were no patients in upper class. The mean duration of disease in our study was 3 yrs. Higher Mean duration was observed in studies done by Nayak PB et al [9] 5yrs and Mathew TL et al 6.7yrs.[12] Plague psoriasis was the most common type in our study. This was consistent with studies done all over India. [9,12,17,18]

Treatment with biologicals requires less frequent dosing as compared to methotrexate which requires weekly dosing. Hence adherence to biologicals is better as compared to non biologicals. In our study the overall treatment adherence was 83.3%. The treatment adherence in study done by Cherukupalli h et al showed adherence of 53%.The study also confirmed that patients takiing methotrexate wer more prone to non adherence.[19] Another study by Rajagopalan M et al showed only 35% adherence to treatment.[20] In the present study, Upper socioeconomic class people were completely adherent to treatment as compared to middle and lower class. Higher the socioeconomic status , more is the treatment adherence. The disease severity had improved and the number of patients in moderate and severe disease category after treatment had reduced and it was found to be significant. The disease severity had improved much for patients taking biologials as compared to those taking other treatments. This can be attributed to treatment adherence , socioeconomic status and affordability of patients. In the present study, psoriasis patients from higher socioeconomic backgrounds tended to opt for biological treatments, prioritizing advanced therapeutic options. Meanwhile, among individuals from the middle class, methotrexate was the preferred choice, often complemented by Apremilast as a secondary option.Majority of patients in lower class preferred methotraxate as treatment choice. This was consistent with study by scala et al.[21] Age and Gender were not associated with treatment received. Whreas Study done by scala et al [21] showed that female gender and those who are less than 35yrs and above 65yrs have less odds of receiving biologicals. The introduction of biologic agents in the last two decades has revolutionized the management of psoriasis. Before their advent, systemic treatments like methotrexate were the primary option for moderate-to-severe cases. The emergence of biologic therapies marks a significant leap forward in both safety and effectiveness. This progress underscores the evolving understanding of psoriasis' underlying mechanisms. With 11 FDA-approved biologics and ongoing research promising more, the treatment landscape for psoriasis has expanded remarkably, offering patients a broader array of options tailored to their individual needs.[22]

CONCLUSION

Only 8% have taken biologicals as treatment for psoriasis. Nearly 1/5th of patients were non-adherent to treatment. Non biologicals had more non adherence as compared to biologicals. Higher the socioeconomic status more is the treatment adherence**.** Also higher socioeconomic class opted for biological treatment.

Evidence-based treatment guidelines emphasize the importance of enhancing patient involvement in treatment decisions. By fostering a collaborative partnership and

empowering patients, these guidelines helps to mitigate the risk of nonadherence and suboptimal clinical outcomes. This approach encourages patients to take part actively in managing their condition, promoting a sense of ownership and accountability in their healthcare journey.

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