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Original Article

Disease severity and quality of life in patients with psoriasis: Special focus on hepatic panel

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Abstract

Objective To assess the disease severity and QoL in ambulatory psoriasis patients in a tertiary care set-up, with a special focus on their hepatic profile.

Methods The study included adult patients clinically diagnosed with psoriasis. Sociodemographic data, disease duration, psoriasis severity, complete hepatic functions were noted. Psoriasis severity and QoL were assessed using Psoriasis Area and Severity Index (PASI) and Dermatology Quality of Life Index (DLQI). Data was statistically analyzed.

Results Mean duration of disease was noted to be 4.85 years among the study population. Mean PASI score observed was 15.04±11.41, while the mean DLQI score was 4.97±3.13. The psoriasis flare was seen in significantly increasing mark for the initial 20 years, followed by later steep decline. QoL however did not show any abrupt changes over the years. Both psoriasis severity and QoL were positively associated with SGOT, SGPT and albumin levels. PASI and DLQI score were both positively correlated with duration of disease ($r=0.69$, $p<0.05$). Psoriasis severity and QoL were also found to have significant positive association, suggesting poorer QoLwith increased disease severity ($r=0.268$, $p=0.001$).

Conclusion Disease severity has been the sole significant predictor of impaired QoL in psoriasis. The study however did not observe significant hepatic abnormalities in the cohort of subjects. Periodic monitoring and treatment of associated conditions can help to achieve better patient outcomes in these chronic treatment scenarios.

Key words
Psoriasis; PASI score; DLQI; Hepatic profile.

Introduction

Psoriasis is a persistent inflammatory skin condition driven by immune system dysfunction, varying in prevalence from 0.09% to 11.4% across the nations globally.[1] Recently there has been increasing recognition that psoriasis is not solely a skin disorder but a systemic condition with various associated comorbidities, including metabolic syndrome and its components, such as obesity, insulin resistivity, hypertension, and atherogenic dyslipidemia. Studies conducted in Italy, India and North America furthermore reported liver function abnormalities as a common finding among psoriatic cases varying in prevalence from 24 to 31%.[2] Such studies also

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emphasized on several factors accounting for biochemical derangements in such patients, especially non-alcoholic fatty liver disease (NAFLD) and non-alcoholic steato hepatitis (NASH).[3-5]

The inclusion of quality of life (QoL) assessments in the evaluation of diseases, including chronic conditions like psoriasis, is vital for a comprehensive understanding of the impact of the disease on patients. QoL measures provide valuable insights into the overall well-being of individuals, beyond just the clinical manifestations of the disease.[6] The Dermatology Life Quality Index (DLQI), is one of the most frequently used assessment tools for quantifying QoL in patients suffering from cutaneous manifestations.[7] Factors such as disease severity, gender, age, site of lesion, comorbidities and psychological state can all be linked with impaired QoL in psoriasis subjects.[8] Several facets of prolonged treatment process pose to be a major burden and serve as a major predictor of reduced QoL. Literature have put forth contradictory evidences of higher QoL impact on females, as compared to males.[9] A case-control study from India including 333 patients observed NAFLD in 17.4% of psoriasis patients as compared to 7.9% of controls. The study stated that psoriatic cases with NAFLD had more severe and longer disease involvement than those without. The very fact makes it more interesting to know if the QoL indices also vary in these cohorts. The present study thus tried to probe the severity of psoriasis and QoL in such patients with a special focus on their hepatic profile.

Methods

The study design was prospective, observational one, carried out in the dermatology outpatient set-up of a tertiary care teaching hospital in eastern India for a period of six months. Prior approval from the Institutional Ethics Committee was obtained for the conduct of the study (EC approval No. CRES-STM/865 dated 02.09.2022). All adult patients with clinical diagnosis of psoriasis of either sex, consenting to be a part of the study were included as participant. Pregnant and lactating women suffering from psoriasis, known case of alcoholic as well as non-alcoholic liver diseases with onset before that of psoriasis were excluded. For all included patients; socio-demographic data, disease duration, treatment details, psoriasis severity, comorbidities (underlying hepatopathy, viral hepatitis, obesity, hypertension, diabetes and other cardiovascular diseases) were noted. Complete hepatic functions were tested and the findings were duly noted. Ultrasonography whole abdomen was performed for evidence of NASH, wherever applicable.

Psoriasis severity was assessed using Psoriasis Area and Severity Index (PASI),[10] which grades the severity of lesions and the patient's treatment response. The PASI score is calculated for each region of the body (typically the head, upper limbs, trunk, and lower limbs) and then aggregated to give an overall PASI score. Each of the region is assessed for erythema, induration, desquamation and affected area. The PASI score can range from 0 (no psoriasis) to a maximum score of 72, indicating severe psoriasis.

QoL was assessed using DLQI,[7,11] a self-administered 10-item questionnaire assessing six different facets of life namely symptoms and feelings, daily activities, leisure, work and school performance, personal relationships, and treatment. Responses are scored from 0 (not at all) to 3 (very much), and the overall DLQI is calculated as a summation of responses from 10 questions resulting in an aggregate score, ranging between 0 and 30. The higher the score,

the more diminished is the QoL.

Considering the prevalence of 42.3% for NAFLD in psoriatic patients from the reference study,[12] at 8% allowable margin of error and 95% confidence interval, the estimated sample size of the study was 94. However, the study went ahead, and included 156 patients and analyzed the data collected statistically. Descriptive variables was represented using mean, standard deviation, frequency and percentages, and relevant variables were analyzed with parametric tests to explore the extent of association. Normality test using Shapiro Wilk test showed that the measures were normally distributed, and hence parametric approach was undertaken. Association between the parametric variables was assessed using Pearson's correlation coefficient. A p value of less than 0.05 was considered statistically significant. Multiple linear logistic regression analysis was performed to find predictors for QoL. All statistical analysis for various measures was performed using Statistical Package for the Social Sciences (Windows version 21.0; SPSS Inc, Chicago [IL], USA) and Microsoft Excel.

Results

The study included 152 subjects, with 54% males and rest females. The majority of the included subjects belonged to the age band of 21 to 40 years, followed by those belonging to 41-60 years respectively. 15.78% (n=24) patients were smokers, and 10.52% (n=16) patients gave present or past history of alcoholism. The most common comorbidity observed was hypertension (27.63%, n=42), followed by diabetes mellitus (8.55%, n=13) and COPD (3.28%, n=5). Underlying hepatopathy or recent history of viral hepatitis was not noted in any of the included participants. Mean duration of disease (psoriasis) was noted to be 4.85 years among the study population. Mean PASI score observed was 15.04±11.41, while the mean DLQI score was 4.97±3.13 **(Table 1)**. Majority (n=68) patients demonstrated 'small effect', followed by 57 patients demonstrating 'moderate' effect on QoL as per total DLQI scoring **(Figure 1)**.

As observed from the PASI scores, the psoriasis flare was seen in significantly increasing mark for the initial 20 years, followed by later steep decline. QoL index however did not show any abrupt changes over the years **(Table 2)**. Biochemical parameters like direct bilirubin, indirect bilirubin, albumin, globulin, SGPT, SGOT and alkaline phosphatase were noted for various disease duration band, as represented in **Table 3**. However, the changes in the hepatic profile were not accompanied with any relevant clinical manifestation in any of the cases.

Table 1 Outcome measures.

	Mean±SD (Range)
Age (in Years)	40.89±12.96 (13.0-72.0)
Disease Duration (in years)	4.85±6.90 (0.20-40.00)
PASI Score	15.04±11.41 (0.80-57.90)
DLQI Score	4.97±3.13 (0.0-14.0)
Hepatic Measures	
Direct Bilirubin	0.3±0.13 (0.10-0.70)
Indirect Bilirubin	0.41±0.20 (0.10-1.30)
Albumin	4.21 ± 0.35 (3.30-5.20)
Globulin	3.35 ± 0.759 (0.70-4.40)
SGPT	31.374 ± 19.37 (10.0-89.0)
SGOT	26.50 ± 10.27 (11.0-59.0)
Alkaline phosphatase	108.30 ±45.35 (43.0-388.0)

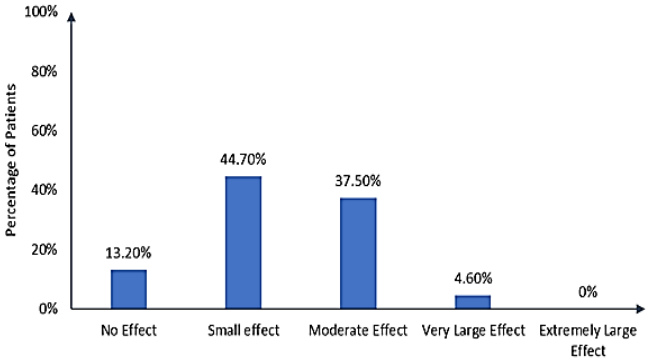

Figure 1 QoL Status among the study participants.

Table 2 PASI and DLQI scoring vis-à-vis disease duration for psoriasis.

	Disease Severity Mean PASI Score [Mean ± SD (Range)]	*Quality of Life Index Mean DLQI Score [Mean ±SD (Range)]*
Less than 1 Year	14.20 ± 10.78 (2.40 – 57.90)	4.86 ±2.99 (0 – 14.0)
1 – 5 Years	14.19 ± 10.45 (0.80 – 52.60)	5.103 ±3.52 (0 – 14.0)
5 – 10 Years	20.15 ± 14.59 (0.80 – 53.00)	5.14 ±2.97 (1.0 – 10.0)
10 – 20 Years	31.20 ± 3.90 (28.90 – 35.70)	5.33 ±2.08 (3.0 - 7.0)
20 – 40 Years	13.37 ±10.40 (5.60 – 35.50)	3.50 ± 2.14 (1.0 – 7.0)
More than 40 Years	6.08 ±3.25 (3.60 – 12.10)	6.00 ±2.91 (3.0 – 10.0)

Table 3 Biochemical parameters in various disease duration.

	Disease Duration Mean ±Standard Deviation (Range)					
	<1 Year	*1 – 5 Years*	*5 – 10 Years*	*10 – 20 Years*	*20 – 40 Years*	*> 40 Years*
Direct Bilirubin	0.30±0.11 (0.12-0.70)	0.32±0.15 (0.10-0.70)	0.27±0.14 (0.10-0.60)	0.21±0.08 (0.14-0.30)	0.26±0.14 (0.10-0.50)	0.32±0.08 (0.20-0.40)
Indirect Bilirubin	0.42±0.20 (0.10-1.30)	0.40±0.19 (0.10-0.90)	0.40±0.24 (0.10-0.90)	0.52±0.20 (0.40-0.75)	0.52±0.27 (0.10-0.80)	0.32±0.27 (0.10-0.70)
Albumin	4.18±0.29 (3.44-4.70)	4.26±0.41 (3.30-5.20)	4.29±0.35 (3.30-4.80)	4.17±0.35 (3.80-4.50)	3.91±0.28 (3.40-4.30)	4.12±0.18 (4.00 -4.40)
Globulin	3.35±0.71 (2.00-4.20)	3.38±0.78 (1.80-4.40)	3.11±1.00 (0.70-4.40)	3.37±0.55 (3.00-4.00)	3.54±0.38 (3.00-3.90)	3.68±0.39 (3.00-3.90)
SGPT	31.08±17.69 (15.00-85.00)	30.71±19.20 (10.00-89.00)	36.95±26.51 (10.00-88.00)	39.67±23.50 (16.00-63.00)	26.63±13.55 (10.00-47.00)	21.60±5.13 (17.00-28.00)
SGOT	24.35±9.01 (15.00-51.00)	27.33±11.14 (11.00-59.00)	29.95±10.12 (13.00-43.00)	35.67±15.50 (18.00-47.00)	26.63±9.93 (13.00-42.00)	21.20±6.26 (15.00-31.00)
Alkaline Phosphatase	107.12±50.87 (54.00- 388.00)	112.09±41.50 (54.00-273.00)	90.76±28.04 (43.00-149.00)	156.33±70.29 (90.00-230.00)	121.25±59.33 (62.00-240.00)	101.80±18.23 (86.00-132.00)

Association was determined between hepatic panel, psoriasis severity and QoL index. Both psoriasis severity and QoL were positively associated with SGOT, SGPT and albumin levels, though the association being sufficiently weak and non-significant. Rest of the parameters were however negatively correlated in weak strength **(Table 4)**. PASI and DLQI score were both positively associated with disease duration. ($r=0.69$, $p<0.05$) Psoriasis severity and QoL were also found to have significant positive association, suggesting poorer QoL with increased disease severity ($r=0.268$, $p=0.001$).

Logistic regression was conducted to assess the best combination of factors predicting QoL (DLQI). Variables like patient's age, disease duration and disease severity (PASI Score) were considered for the model. DLQI was found to be positively affected by disease severity only ($\beta=0.074$, SE=0.022, $p=0.001$, 95% C.I=0.031 to 0.117).

Discussion

Psoriasis is a challenging public health issue with an estimated world prevalence of 125 million people. Psoriasis presents a geographical variation in prevalence, due to climatic differences and variability in genetic makeup and exposure. Classically thought to be a chronic inflammatory condition primarily affecting skin, psoriasis is now known to have greater systemic effect. In its inflammatory microenvironment, the proinflammatory mediators spread from lesions to distant tissue systems thus leading to allied conditions.[13] Evidences suggests that psoriasis has intrinsic potential to cause hepatic abnormalities, and if left untreated they can lead to serious hepatic injury. A possible association between psoriasis and autoimmune hepatic conditions like neutrophilic cholangitis or primary cirrhosis has been detailed.[14] Furthermore the systemic treatment options with drugs like methotrexate

Table 4 Correlation matrix.

	PASI Score		DLQI Score	
	Pearson correlation coefficient (r)	*Significance (p Value)*	*Pearson correlation coefficient (r)*	*Significance (p Value)*
Direct Bilirubin	-0.052	0.526	-0.104	0.202
Indirect Bilirubin	0.028	0.732	-0.124	0.129
Albumin	0.117	0.150	0.220	0.007
Globulin	-0.046	0.571	-0.122	0.133
SGPT	0.086	0.293	0.034	0.681
SGOT	0.065	0.426	0.099	0.226
Alkaline Phosphatase	-0.064	0.431	-0.056	0.494

and cyclosporin can be potentially hepatotoxic, and management approaches are challenging and warrants caution.[15]

Psoriasis is a condition affecting multiple organ system and is associated with several comorbidities adding to both physical and psychosocial burden. NASH, a coexisting medical condition, stands as the primary factor responsible for the development of cirrhosis, fibrosis, and malignant hepatoma. The likelihood of NASH occurrence in individuals with psoriasis may be higher compared to what is typically seen in the general population.[16] Research suggests that inflammation resulting from psoriasis represents a distinct risk factor for the development of NASH.[17] Besides NASH, psoriasis can also lead to other liver conditions, including drug-induced hepatitis, alcoholic hepatitis, and, on rare occasions, neutrophilic cholangitis. Several therapeutic agents used in psoriasis management and their allied conditions including methotrexate, acitretin, biological agents and statins are potentially hepatotoxic. Hepatic abnormalities further necessitate more carefully monitoring of patients. Results from a prospective study stated that the psoriasis severity is associated with the severity of NASH. Patients with psoriasis as well as NASH had more severe hepatic damage, if they had a higher severity of psoriasis.[18] Individuals with psoriasis who have risk factors for hepatic diseases (e.g., obesity, diabetes, or heavy alcohol use) should be vigilant about liver health. Regular liver function tests and close monitoring by a healthcare provider are recommended when necessary. Psoriasis cases who are being treated with medications that have the potential for hepatotoxicity should have their liver function monitored as part of their treatment plan. Thus, the present study tried to probe any probable association between psoriasis severity and hepatic panel. The study tried to assess the biochemical parameters specifically hepatic panel in line with the duration of psoriasis presentation. The study also tried to analyze the QoL in psoriasis patients since this is a chronic disease.

Our study included 152 subjects which 54% male representation. Mean age of the presenting population was 40.89 years. Mean disease duration was observed to be 4.85 years, with a wide dispersion ranging from less than a year to 40 years. PASI, one of the most widely used numerical assessment that combines the evaluation of both the severity of psoriatic lesions and the affected area of the body into a single composite score. Our study noted a mean PASI score of 15.04 for the disease population, which is quite in similar to the findings by Paul *et al*.[19]

QoL is an important facet in psoriasis patients. Various instruments used to assess QoL are Dermatology Specific Quality of life (DLQI), Skindex-29, Skindex-16, Family Dermatology Life Quality Index, Dermatology Quality of Life Scales (DQoLS), Psoriasis Disability Index, Freiburg Life Quality Assessment, Cardiff Acne

Disability Index. Our study noted a mean DLQI score of 4.97 for the enrolled population, with scores ranging as low as 0 to as high as 14. As per interpretation of aggregate DLQI scoring, QoL was minimally to moderately affected in the psoriasis patients in our study. DLQI scoring was found to be associated with some of the hepatic parameters. With increase in duration of psoriasis, the QoL index was found to be increasing, suggesting poorer QoL with increased disease duration, which bears similarity with findings from other studies.[20] Our study noted positive association between severity of psoriasis and QoL, which corroborates with other studies.[20-22]

Assessing the correlation matrix, it was observed that both psoriasis severity and QoL were associated with levels of SGOT, SGPT and albumin. However, the strength of association was found to be weak. A possible reason behind this finding is that our duration of psoriasis had a wide dispersion, which welcomes a wide variation in severity indices and hence the QoL. An independent predictor of QoL was found to be the psoriasis severity as per the regression model. However, to comment on association of a hepatic parameter with PASI and/ or DLQI, there must be cohort for individual disease duration and correlation with respect to each duration strata adjusting for all confounders should be considered, which serves as a limitation of the present study. A relatively longer duration study with more sample size can robustly generalize the findings of our study.

Conclusion

Disease severity has been the sole significant predictor of impaired QoL in psoriasis patients. No significant hepatic abnormalities were however observed in the cohort of psoriatic subjects. Periodic monitoring and treatment of associated conditions can help to achieve better patient outcomes in these chronic treatment scenarios.

Declaration of patient consent The authors certify that they have obtained all appropriate patient consent.

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Conflict of interest Authors declared no conflict of interest.

Author's contribution

KC, SM: Substantial contributions to study design, acquisition of data, manuscript writing, has given final approval of the version to be published.

DKB, RG: Substantial contributions to study design, acquisition of data, critical Review, has given final approval of the version to be published.

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