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Assessing the range of renal abnormalities in psoriatic patients and estimating the risk of chronic kidney disease

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Abstract
Introduction and Objectives: Psoriasis is a persistent skin illness characterised by papules and scales, with several hereditary and environmental factors contributing to its development. The aim of this study was to assess the prevalence and kind of renal abnormalities in patients with psoriasis.
Material and Methods: This study was prospective and observational. The investigation was carried out at the Department of DVL, Gouri Devi Institute of Medical Sciences and Hospital, West Bengal. The study was conducted from April 2020 to March 2021. 80 patients were included in this investigation.
Results: We aimed to assess the prevalence of renal abnormalities in a group of patients with moderate to severe psoriasis who did not have any history of renal disease or other co-morbidities. As a control group, we included people from the general public who came to the master health clinic but did not have any history of skin or renal disease, diabetes, or hypertension. Participants in this study were adults (mean age 45) from the 40s and 50s who had been ill for at least a year and up to 18 years; they were also consistent with the age range for those who should have been in their 30s or 40s when they presented with symptoms. In our study, we observed a male-female ratio of 1.56%, which is distinct from the norm, with 39% of the participants being female and 61% being male. It follows that psoriasis is nearly twice as common in males as in females among Indian patients.
Conclusion: Consequently, the presence of psoriatic nephropathy must be taken into consideration, and it is crucial to regularly screen patients with renal function tests such as blood urea, serum creatinine, urine albumin excretion rate, and protein creatinine ratio as part of the toolbox for managing chronic psoriasis.

Keywords: Renal abnormalities, psoriatic, patient, chronic kidney disease

Introduction

An enormous number of people - 125 million to be exact - suffer with psoriasis, a chronic immune-mediated disease. Histological findings in psoriasis include epithelial hyperplasia with incomplete keratinization and infiltration of different inflammatory cells in the dermis, which is mirrored in the clinical manifestation of a scaly red rash. When living with psoriasis, the majority of patients notice a decline in their quality of life, and many report that the condition has a major detrimental effect on their mental and social health. Actually, for many psoriasis patients, the biggest source of stress in their daily life is the avoidance-oriented coping strategies that they use [1-3].

Psoriasis is often linked to other disorders that affect more than just the skin, according to an increasing amount of research. Heart disease, cancer, infections, and mental illness have been the primary foci of psoriasis comorbidity studies. The relationship between psoriasis and renal damage has been consistently documented with the expanding knowledge of psoriasis. Microalbuminuria and renal failure are more common in psoriasis patients, according to multiple studies. To sum up, psoriasis has the potential to impact every system in the body. Consequently, more research into the causes and mechanisms of psoriasis is necessary. Those afflicted have substantial deformity and psychological distress as a result. The exact cause of psoriasis is still a mystery. A number of cytokines and chemokines, as well as cell-mediated immune system activation (including T cells and dendritic cells), are discovered to initiate keratinocyte hyperproliferation [4-6].

Rarely do people with psoriasis develop renal illness.
These days, it's not uncommon for glomerular illnesses including secondary renal amyloidosis, membranous glomerulopathy, IgA nephropathy, and membrano-proliferative glomerular disease to manifest in psoriasis patients. The treatment of moderate to severe psoriasis is increasingly involving the use of nephrotoxic medications. In addition, certain research has shown that people with naïve psoriasis who have not taken any medicines that could be harmful to the kidneys experience anomalies in their renal function. Therefore, it is important to study psoriasis patients to find out how common renal disease is, whether or not "psoriatic nephropathy" actually exists, and whether or not subclinical glomerular dysfunction is present [7-9].
The purpose of this research was to identify the frequency and nature of kidney anomalies in psoriasis patients. The goals of this study are to find out whether psoriasis patients have a higher prevalence of renal disease than the control group and to examine the relationship between renal disease and the cutaneous disease outcome in psoriatic patients.

Materials and Methods

This study was prospective and observational. The investigation was carried out at the Department of DVL, Gouri Devi Institute of Medical Sciences and Hospital, West Bengal. The study was conducted from April 2020 to March 2021. 80 patients were included in this investigation.

Inclusion criteria

- Patients with moderate to severe psoriasis with PASI>10.
- Male and female psoriasis patients and controls older than 12 years.
- Patients and controls willing to follow up in the Nephrology OPD.

Exclusion criteria

- Any other dermatological conditions present.
- Moderate psoriasis.
- Co-morbid conditions such diabetes.
- Renal illness that already exists.

Statistics Analysis

Analysis of the data was done using IBM. Version 23.0 of the SPSS statistical application. Categorical data were analyzed using frequency and percentage analysis, whereas continuous variables were calculated using mean and standard deviation. We utilized an unpaired sample T-test to find out whether there was a statistically significant difference between the independent groups' bivariate samples. We used Pearson's Correlation to see how well the variables were related to one another.

Results

After 80 patients with moderate to severe psoriasis met the inclusion and exclusion criteria, they were enrolled in our study. Eighty patients who met inclusion criteria but did not have any prior skin or kidney diseases made up the control group.

Table 1: Age

Age ranges	Patients	%
11-20	Males-2, Females-1	3.75
21-30	Males-2, Females-10	15
31-40	Males-08, Females-10	22.5
41-50	Males-12, Females-8	25
51-60	Males-15, Females-06	26.25
61-70	Males-6, Females-Nil	7.5
Total	80	100

The majority of our participants were between the ages of 51 and 60, with 3.75% falling into the 11–20 age bracket and 7.5% into the 61–70 age bracket.

Table 2: Duration of illness in years

Sr. No.	Duration	Patients	%
1.	1-5 years	50	62.5
2.	6-10 years	25	31.25
3.	11-15 years	4	5.00
4.	16-20 years	1	1.25
	Total	80	100

Approximately 31.25% of the individuals in our study had been diagnosed with psoriasis for 6 to 10 years. 62.5% of the patients had been diagnosed with the condition for a duration ranging from 1 to 5 years.

Table 3: Clinical Types

Sr. No.	Clinical Type	Frequency	Percent
1.	Chronic plaque	71	88.75
2.	Erythroderma	1	1.25
3.	Flexural psoriasis	1	1.25
4.	Palmoplantar	5	6.25
5.	Psoriatic arthritis	1	1.25
6.	Pustular psoriasis	1	1.25
	Total	80	100.0

The most prevalent clinical type observed in our patients was chronic plaque psoriasis at 88.75%, followed by palmoplantar psoriasis at 6.25%, and psoriatic arthritis at 1.25%. Other forms of psoriasis were uncommon in our study.

Table 4: Related Diseases

Sr. No.	Associated Diseases	Cases	Total
1.	Epilepsy	1	1.25
2.	NAFLD	3	3.75
3.	GERD	1	1.25
4.	Hypercholesterolemia	1	1.25
5.	Obesity	2	2.50
6.	Osteo arthritis	1	1.25
7.	Hepatitis B	1	1.25
8.	Nil	70	87.5
	Total	80	100

Arthritis is the most prevalent related condition in psoriasis, identified as a sub-type in our study and observed in 5% of the patients. Additionally, 3% of the patients had Nonalcoholic fatty liver disease, and 2% were obese, with a small percentage presenting additional non-specific diseases. The mentioned comorbidities were statistically insignificant.

Discussion

We aimed to assess the prevalence of renal abnormalities in a group of patients with moderate to severe psoriasis who did not have any history of renal disease or other co-morbidities. As a control group, we included people from the general public who came to the master health clinic but did not have any history of skin or renal disease, diabetes, or hypertension. Participants in this study were adults (mean age 45) from the 40s and 50s who had been ill for at least a year and up to 18 years; they were also consistent with the age range for those who should have been in their 30s or 40s when they presented with symptoms. In our study, we observed a male-female ratio of 1.56%, which is distinct from the norm, with 39% of the participants being female and 61% being male. It follows that psoriasis is nearly twice as common in males as in females among Indian patients [8-11].

According to our study, the chronic plaque type psoriasis was observed in 84% of patients, followed by palmoplantar psoriasis in 7%, psoriatic arthritis in 5%, pustular psoriasis in 2%, and erythrodermic psoriasis in 1%. Although just one patient initially presented with guttate psoriasis, they were classified as chronic plaque type due to their progression from the former. The study was in agreement with our findings. We found 5% of individuals with psoriatic arthritis, which is lower than the reported prevalence of 7% to 42% in the general population of psoriasis patients. There was a gender gap in the prevalence of psoriatic arthritis in Indian studies. Contrarily, research conducted in the West found that psoriatic arthritis was more prevalent in females [12-14].

There was a small female predominance among the 3% females and 2% men in our study sample of individuals with psoriatic arthritis. Consistent with previous research, ours found extremely few cases of pustular, erythroderma, and guttate psoriasis. Our patient population also had obesity, hypercholestrolemia, hepatitis B, osteoarthritis, and diabetes, in addition to hypertension and hypertension. Patients with diabetes s were not included in this study, thus we cannot conclude that the most prevalent co-morbidity of psoriasis is a fourfold increased risk of diabetes mellitus [15-17].

Although psoriatic arthritis was listed as the most prevalent co-morbidity with psoriasis, our study did not include it as a comorbidity because it is considered a distinct subtype of psoriasis [18, 19]. The psoriasis susceptibility loci that contain the PSORS2, PSORS3, and PSORS4 genes are found in close proximity to those that are associated with metabolic syndrome, type 2 diabetes, familial hyperlipidemia, and cardiovascular disease. Just being overweight increases your chance of getting psoriasis. In our study, it was observed in 2% of patients and was positively correlated with the severity of the disease as measured by a PASI score more than 20. Patients with psoriasis had a much greater prevalence of nonalcoholic fatty liver disease compared to controls, according to this study. The exclusion of individuals with additional co-morbidities likely contributed to the low prevalence of fatty liver in our patient population (approximately 3%) [20-22].

A subsequent urine test validated the positive results observed in seven patients for whom the dipstick method had estimated the presence of urine protein. Proteinuria levels of 1+ or 30 mg/dl were observed in 7% of our patients, as compared to 6% of the control group. The prevalence of micro-albuminuria was the same in the control group as it was in our study; 2% of patients had it, with 1% having levels 2+ or equal to 80 mg/dl and 1% having levels 20 mg/dl. Using the protein-creatinine ratio, we confirmed that all cases and controls were within the normal range.

Up to now, no research has estimated urinary anomalies in psoriasis patients using urine spot protein creatinine ratio. We found no variations in UAE between psoriatic patients and healthy controls, which is consistent with previous research that connected 24-hour urine albumin excretion rate estimation [23-25].

In our investigation, two patients without diabetes and one patient with diabetes both had renal glycosuria of 1+, while six of the control subjects who developed diabetes later on had glycosuria. It was shown that 20% of psoriasis patients had renal alimentary glycosuria. We likely eliminated diabetic people from our study, which is why our results showed significantly lower levels [24-26].

One plus in three patients and two plus in two patients were determined to be the presence of RBCs in the dip stick test, which accounted for 5% of the patients in our study. A single control subject had a bloody pee sample. However, the p value was greater than 0.05, therefore it was not statistically significant. When the dipstick method reveals at least one positive result, it is considered microscopic hematuria. Thus, 5% of our sample showed little blood in urine. Their study population had a prevalence of 15.5% for microscopic hematuria, while the control group had a frequency of 13.3% [25-27]. This can be due to the fact that they use different approaches to evaluation and measurement. We utilized the Arkray pocket chem analyzer, while they utilized the UriScan from YD Diagnostics in Seoul, Korea, for evaluation. We found a somewhat greater rate of hematuria compared to the group that did not have any patients with substantial hematuria. In our patients, the PASI score was unrelated to any abnormal urine tests [26-28].

All of the blood glucose, serum electrolyte, blood albumin, serum creatinine, and blood urea levels were within normal ranges in our study. In contrast to controls, psoriasis patients eventually develop moderate to severe renal insufficiency, rather than preclinical glomerular dysfunction. Ultrasound examinations of the kidneys showed no abnormalities in size or cortico-medullary distinction in any of the individuals who were a part of our investigation [25-28].

Out of the total number of patients with moderate to severe psoriasis, 78% were given methotrexate, 11% biologicals, 3% cyclosporine A, and 7% topical steroids and emollients alone. Patients taking methotrexate were the only ones in our study group to experience renal problems, such as proteinuria and hematuria. Patients taking cyclosporine for its crisis-busting effects did not exhibit any abnormalities in their urine [27-29].

Conclusion

Psoriasis is an inflammatory skin condition that affects multiple organs and has a history of chronic inflammation. Very few people with psoriasis also have chronic renal illness. Chronic kidney disease is more common in patients with psoriasis forms that cause inflammation, such as pustular psoriasis and psoriatic arthritis, as well as in patients with mild to severe psoriasis, early onset psoriasis, and long-standing psoriasis. Our research population had normal results for renal function tests such as blood urea,

serum creatinine, serum albumin, and serum electrolytes. More sophisticated studies are required to provide more definitive findings. Consequently, the presence of psoriatic nephropathy must be taken into consideration, and it is crucial to regularly screen patients with renal function tests such as blood urea, serum creatinine, urine albumin excretion rate, and protein creatinine ratio as part of the toolbox for managing chronic psoriasis.

Funding
None.

Conflict of Interest
None.

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