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CROSS SECTIONAL OBSERVATIONAL STUDY OF RELEVANCE OF RENAL DAMAGE AS AN INDICATOR OF PSORIATIC ARTHRITIS IN PSORIASIS PATIENTS

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ABSTRACT:

Background: Renal dysfunction in patients with psoriasis is multifactorial and is seen more commonly with severe psoriasis, disease of long duration and psoriatic arthritis. Material and Method: Single-center cross-sectional observational study was conducted in tertiary care Medical College Hospital, Chennai, India to compared renal function parameters in patients with Psoriasis with psoriatic arthritis (PsA), psoriatic without psoriatic arthritis and control. Total of 60 adult patients, 20 in each group, those with psoriasis having PsA; psoriasis without PsA and control were included. Blood urea, Serum creatinine, Urine albumin, and 24-hour urine protein were done and values analyzed. Results: Prevalence of psoriatic arthritis was greater in males. Patients with psoriatic arthritis had statistically significant elevation in serum creatinine, urine albumin and 24-hour urine protein. There was no statistically significant elevation of blood urea level in patients with psoriasis having psoriatic arthritis. Conclusion: Serum creatinine, urine albumin and 24-hour urine protein maay be considered as parameters which can be done for adult psoriasis patients as a screening test to suspect PsA. Early detection of PsA and appropriate management can help

prevent crippling of joints and patients with renal involvement may be helped with precision therapy in future.

Keywords: adult psoriasis, psoriatic arthritis, kidney, serum creatinine, urine albumin, 24 hr urinary protein.

INTRODUCTION

Pathogenesis of psoriasis is linked to chronic inflammatory states caused by activated T lymphocytes, cytokines (TNF α) and various growth factors and psoriatic arthritis causes significant physical and psychological morbidity to patients with psoriasis[1-3]. The severity of psoriasis in the common population is variable, with most patients having mild disease which involves ≤ 2% body surface area[4-6]. Secondary renal amyloidosis in psoriatic arthritis and drug-induced renal disease secondary to drugs such as methotrexate or cyclosporine are known side effects. IgA nephropathy is also known to occur in psoriatic patients. The exact mechanism of this relationship is yet to be identified[6]. Renal damage in psoriasis can be due to one of the three proposed causes namely, 1. Immune mediated, 2. Drug related and 3. Chronic renal damage[7]. However, the exact mechanism of ‘‘psoriatic nephropathy’’ or ‘‘psoriatic kidney disease.’’ is yet to be elucidated though subclinical albuminuria and glomerular dysfunction have been observed in patients with psoriasis of long duration[8-10]. The aim of this study was to find if there is a significant correlation between renal function impairment and psoriatic arthritis and to screen patients with altered renal function tests for psoriatic arthritis, which will shift the focus on providing non-nephrotoxic medication in individuals suspected of psoriatic arthritis and contemplating on the use of anti VEGF drugs in the presence of renal involvement

MATERIAL AND METHOD:

Cross-sectional observational study was conducted in tertiary care teaching hospital at Chennai, India which included 60 subjects who were divided into 3 groups:

Group A – patients with psoriasis having PsA;

Group B – patients with psoriasis without PsA;

Group C – healthy individuals with neither psoriasis nor psoriatic arthritis

The study was approved by the Institutional Ethics Committee. Inclusion Criteria included Age range of 18 and above, All patients with psoriasis and psoriatic arthritis irrespective of the severity of disease in groups A&B and age and sex matched healthy individuals in group C. Those with pre-existing kidney problems, and those on Disease Modifying Anti-Rheumatic drugs (DMARDs), pregnant women were excluded. PsA was diagnosed based on CASPAR criteria. All subjects were tested for Blood urea, Serum creatinine, Urine albumin, and 24-hour urine protein. All the demographic and data related to disease and medication, were documented. Blood urea was analyzed by GLDH/Urease method, serum creatinine by Jaffe's kinetic method, urine albumin through turbidimetric method and 24-hour urine protein by Pyrogallol Red Molybdate method. All the data were analyzed by the SPSS version 16. One-Way ANOVA, with Turkey HSD and Chi-squared test was used for the statistical analysis.

The results (table 1) revealed that the predominance of psoriatic arthritis was greater in males although psoriasis more commonly occurred in females. Healthy individuals were taken as males and females in equal proportion for comparison.

Table:1 Type of patient *SEX Cross tabulation

	SEX		
	Male	Female	Total

type of pt	Psoriatic Arthiritis	Count	15	4	19
		% within type of pt	78.9%	21.1%	100.0%
	Psoriasis	Count	9	12	21
		% within type of pt	42.9%	57.1%	100.0%
	Healthy Individuals	Count	10	10	20
		% within type of pt	50.0%	50.0%	100.0%
Total		Count	34	26	60
		% within type of pt	56.7%	43.3%	100.0%

Table 1: Cross tabulation of association between the three groups and gender

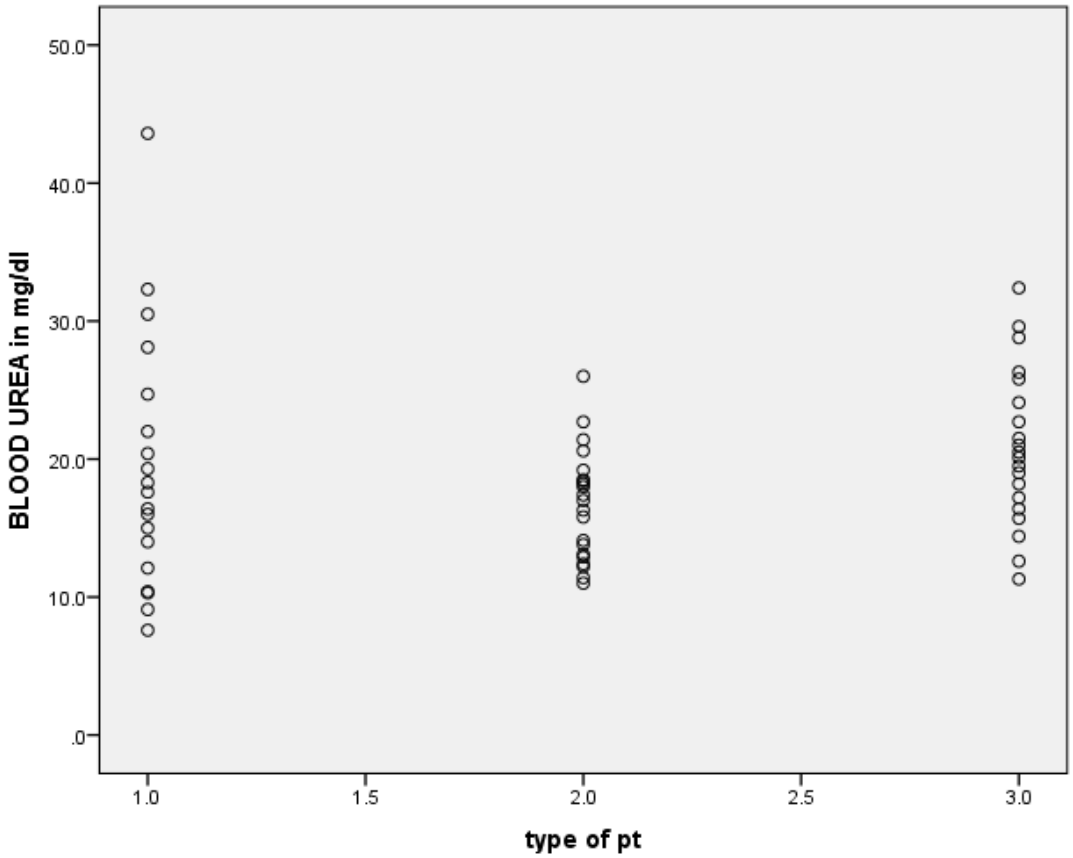
Figures 1-4 and table 2 depict renal function levels among the three groups revealing the following:

1. Higher blood urea level in psoriatic arthritis [(mg/dl), (M=19.353 ± 9.1976) and p value of > 0.05] indicating that blood urea is not statistically significant.

2. Patients with arthritis had significantly elevated serum creatinine level [(mg/dl), (M=0.8347 ± 0.13966) and p value of < 0.05] indicating that serum creatinine level is statistically significant.

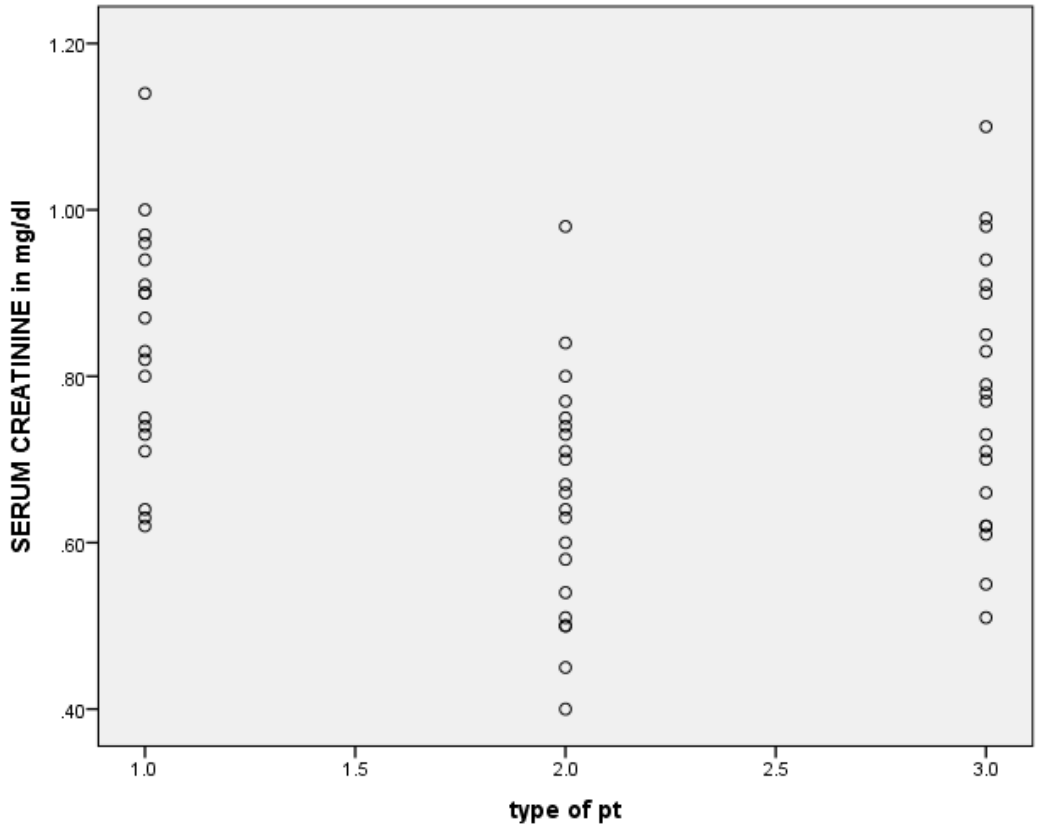
3. Patients with PsA had elevated urine albumin level [(mg/dl), (M=6.270±2.9446) and p value of < 0.05] indicating that urine albumin level is a statistically significant parameter.

4. Patients with PsA showed increased level of 24-hour urine protein [(mg/24hours), (M=155.296 ± 52.0910) and p value < 0.05] indicating a statistically significant parameter.



[1-Psoriatic arthritis; 2-Psoriasis; 3-Healthy individuals]

Figure 1: Scattered graph showing blood urea level in the three groups



[1-Psoriatic arthritis; 2-Psoriasis; 3-Healthy individuals]

Figure 2: Scattered graph showing serum creatinine level in all three groups

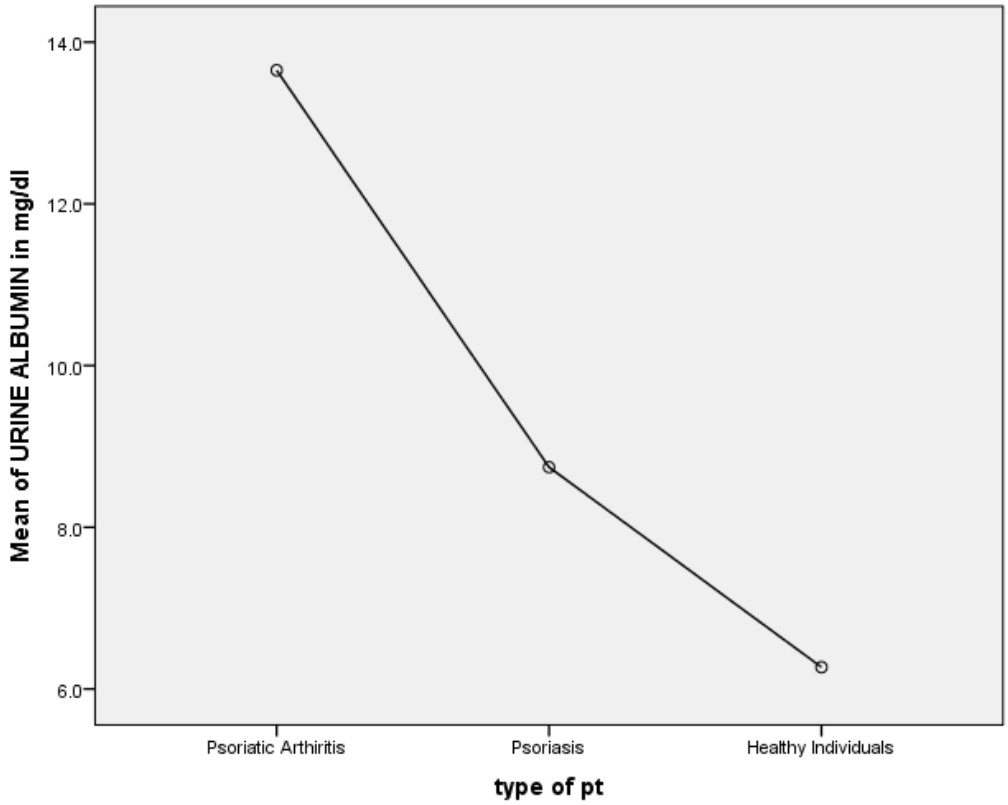


Figure 3: Line graph showing urine albumin level in 3 groups

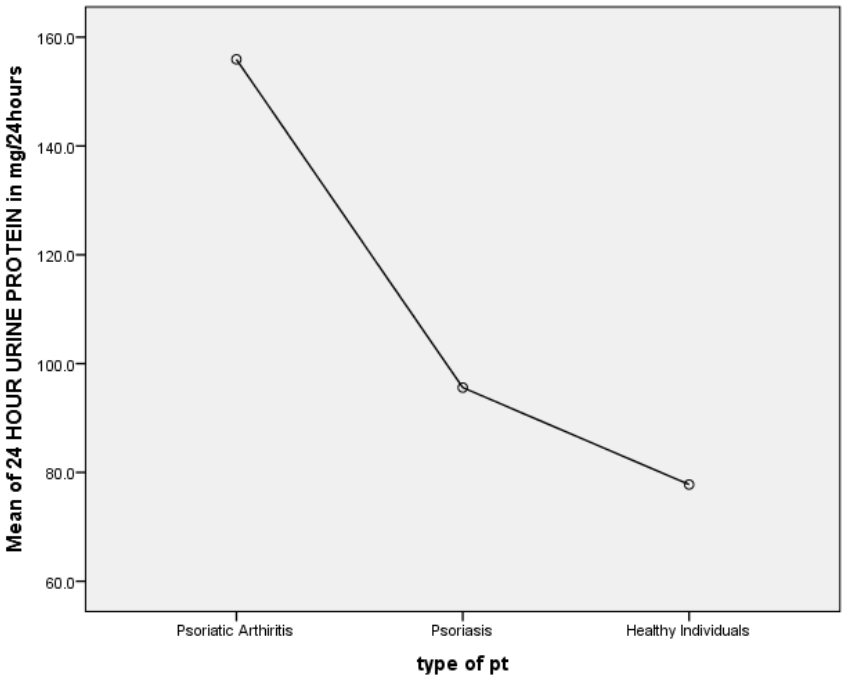


Figure 4: Line graph showing mean of 24-hour urine protein in 3 groups

Table-2		Sum of Squares	Df	Mean Square	F	Sig.
BLOOD UREA in mg/dl	Between Groups	183.273	2	91.637	2.125	.129
	Within Groups	2457.543	57	43.115		
	Total	2640.816	59			
SERUM CREATININE in mg/dl	Between Groups	.351	2	.176	8.104	.001
	Within Groups	1.236	57	.022		
	Total	1.587	59			
URINE ALBUMIN in mg/dl	Between Groups	548.297	2	274.148	8.183	.001
	Within Groups	1909.681	57	33.503		
	Total	2457.977	59			
24 HOUR URINE PROTEIN in mg/24hours	Between Groups	65109.500	2	32554.750	23.809	.000
	Within Groups	77936.764	57	1367.312		
	Total	143046.264	59			

Table 2 depicting statistical significance of renal function levels among the three groups

DISCUSSION:

The prevalence of renal disease in psoriatic patients is unknown; until recently, the number of references briefing the association between psoriasis and glomerulopathies has increased. Adult patients with psoriasis of long duration were found to suffer from glomerulonephritis of varying types [11,12,]. More than 50% of normotensive psoriatic patients showed an enhanced excretion of albumin. Since microalbuminuria has been indicated as a reliable index to predict the development of renal impairment, the finding of an enhanced albumin loss in psoriatics represents a further risk factor in these patients of having cardiovascular disease[13].

The mechanisms mediating renal insufficiency in psoriasis remain largely unclear. There are three possibilities: (a) chronic inflammation driven by cell mediated immunity with T-cell activation and variety of interleukins and cytokines, including TNFα, is thought to be the cause of glomerular injury in psoriasis; (b) drugs used for psoriasis, in particular methotrexate and cyclosporine, could cause kidney damage; (c) given the higher prevalence of diabetes and hypertension among patients with psoriasis, observed renal abnormalities in psoriatic patients could be the consequence of these comorbidities[14]. Certain glomerular diseases, including IgA nephropathy, secondary renal amyloidosis, membranoproliferative glomerulonephritis, and membranous glomerulopathy are commonly seen in psoriatic patients than in the general population[15].

Assessment of renal function revealed that patients with psoriatic arthritis had significantly elevated urea and creatinine. Similarly, patient with psoriasis but without concomitant psoriatic arthritis still had significant derangement of blood urea and creatinine, compared with the control group. In a cross-sectional study, Khan and colleagues demonstrated elevated serum creatinine and urea levels and significant albuminuria in patients suffering from psoriasis[1]. renal impairment is more prevalent in psoriatic patients especially in subjects with concomitant PsA.[1] Average urinary albumin excretion in normotensive nondiabetic psoriatic patients was elevated, and it was

hypothesized that subclinical glomerular dysfunction exists in some psoriatic patients who were never treated with systemic potentially nephrotoxic drugs[5].

A link between Urine albumin excretion and the severity of psoriasis was found, in a study by Erkan. However, despite differences, the study clearly found a higher prevalence of pathologic albuminuria in patients with psoriasis than in healthy controls. Mean 24-h albuminuria was greater in the psoriasis group, but the difference did not reach statistical significance. When individuals were categorized according to the level of albuminuria, a significant difference in the number of patients with pathologic albuminuria between psoriatic patients and controls was demonstrated[15].

In our study, we have seen higher prevalence of PsA in male patients with psoriasis than females. While the prevalence of psoriasis, was found to be greater in females than males as seen in other studies[13]. Our study has demonstrated that patients with PsA have deranged renal function compared to psoriasis and healthy individuals. Some studies[1,15], have shown an increase in blood urea level whereas our study results did not reveal statistically significant increase in blood urea level. Therefore, elevated blood urea level may not be taken as a parameter for assessing renal damage. Whereas, Sserum creatinine level is seen increased among the psoriatic arthritis patients suggesting a significant renal damage[13,17]. Microalbuminuria is a marker of glomerular damage and can be used to predict diabetic or hypertensive nephropathy[16]. In our study, urine albumin has a higher value in psoriatic arthritis patients than psoriatic patients without arthritis, when compared to healthy control. It was observed that psoriatic patients having relapse and PsA had significantly higher serum creatinine levels [18]. Though end stage renal disease was high in patients with PsA, those who had control of disease with systemic therapy had no such association [19]. Our study has shown significant values of 24-hour urine protein depicting that it can be taken

as a parameter for assessing renal function. Further follow up of our patients may throw more light on this.

Varied renal manifestations were observed in patients with severe psoriasis and PsA in up to as high as 41.7% of PsA cases [20-22]. According to Wan et al the prevalence of chronic kidney disease in patients with psoriasis was high [23]. Plasma vascular endothelial growth factor concentration is significantly elevated in patients with PsA and may adversely act on renal permeability [24] with association between microalbuminuria and psoriatic arthritis being well documented [25] Deranged renal function and proteinuria seen in our study correlates with the observations made by different authors who observed deranged renal function in adult patients with psoriasis, especially if they had concomitant PsA. Authors have documented a positive correlation to disease severity [26, 27,28]. Nephropathies and end-stage renal failure were reported in patients with acute forms of psoriasis such as generalized pustular psoriasis and erythrodermic psoriasis [29]. Anti VEGF drugs may prove promising in those patients with poor renal function. Treatment with bevacizumab an anti VEGF agent for metastatic renal cancer in a patient who also suffered from psoriasis and PsA has induced remission of psoriasis and PsA. Thus, screening for renal impairment in those with PsA and early detection will help this group of patients benefit from anti VEGF therapy.

Limitations: Small sample size, not comparing the details of drugs other than DMORD consumed, exclusion of pustular psoriasis, and erythroderma in this study are the limitations.

Future scope: We propose to take up a similar study using larger sample size with a detailed drug history, including all types of psoriasis.

CONCLUSION

Renal function is impaired in both psoriasis and psoriatic arthritis. Involvement of other systems with psoriasis and psoriatic arthritis are being studied widely whereas the involvement of renal system with psoriasis has not been largely researched in Indian patients.

According to our study, statistically significant values of serum creatinine, urine albumin and 24-hour urine protein were observed in patients with psoriatic arthritis. Blood urea values were not statistically significant. This study has shown an increased incidence of renal impairment in both psoriatic arthritis and psoriasis.

To conclude, serum creatinine, urine albumin and 24-hour urine protein may be considered as parameters which can be done for every psoriasis patient as a screening test. An elevated 24-hour urinary protein may be considered as a clue to development of psoriatic arthritis and ultrasonogram of Tendo Achillis be done to detect early enthesitis. Usefulness of anti VEGF drugs in such patients can also be considered in future.

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