



## SERUM URIC ACID CONCENTRATION (SUAC): A USEFUL TOOL TO ASSESS EXTENT AND SEVERITY OF CHRONIC PLAQUE PSORIASIS IN PAKISTANI POPULATION.

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**ABSTRACT... Objectives:** Psoriasis is a systemic chronic inflammatory autoimmune disease. Psoriasis can lead to multiple complications and co-morbidities. It has also been observed that raised serum uric acid levels predispose to gouty arthritis and also thought to be a risk factor for cardiovascular mortality and morbidity. The basic aim of this study was to ascertain level of serum uric acid in patients with chronic plaque psoriasis and control cases which might be a useful tool for assessing the extent and severity of chronic plaque psoriasis. **Study Design:** Case control study. **Setting:** At Outpatient's Department (OPD) of Department of Dermatology, PNS Shifa, Karachi. **Period:** From January 2013 to December 2016. **Material & Methods:** One hundred and ninety four (194) patients were taken in this study and 97 patients were biopsy proven cases of psoriasis and 97 other participants included as control cases reporting to OPD with other complaint like acne, hair fall and fungal infections. After written and informed consent, 5ml of venous blood was drawn in sterile syringe and using gel sample tube to see the serum uric acid levels. On the basis of laboratory reports the elevated serum uric acid level in psoriatic versus normal controls was recorded on a pre-designed proforma. **Results:** There were 54.6% (106/194) male and 45.4% (88/194) female. Elevated serum uric level was 4.5 times (Approximate of 4.46) more common in cases than control group (OR: 4.46 95%CI: 1.83 to 10.91). **Conclusion:** Raised levels of serum Uric acid have been seen frequently in psoriatic patients. Early treatment for higher levels of serum uric acid might play a critical role in the better treatment of psoriatic patients. These results revealed that serum uric acid concentration (SUAC) of psoriasis may play a vital role in assessing the complex multifactorial etiology of the psoriasis, severity and other possible metabolic factors.

**Key words:** Hyperuricemia, Psoriasis, Serum Uric Acid.

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## INTRODUCTION

Psoriasis is a disease of the skin which is chronic and inflammatory with involvement of multiple factors in its development. This disease is hyperproliferative and autoimmune in nature. Genetic, immunological and environmental factors have a pivotal role to play in the development of psoriasis.<sup>1</sup> The clinical features of psoriasis include erythematous (red) silvery plaques over extensor aspects of the body and scalp.<sup>2</sup> It affects 120 to 180 million peoples of the World population and Prevalence of 0 to 11.8%.<sup>3</sup> The exact etiology is unknown.<sup>4,5</sup> but many authorities say it can be associated with metabolic syndromes including obesity; dyslipidemia and type 2 diabetes mellitus<sup>6</sup> Up to 30% cases are associated with

chronic inflammatory psoriatic arthritis.<sup>3</sup> The raised level of serum uric acid (hyperuricemia) in psoriasis patients is due to increase in purine metabolism as a result of rapid epidermal cell turnover.<sup>6</sup> Raised serum uric acid level in psoriatic patients is an accepted co-morbidity,<sup>7</sup> which ultimately results in gouty arthritis and well known risk factor for cardiovascular mortality and morbidity.<sup>8</sup> Psoriatic arthritis patients have vulnerability of having subclinical atherosclerosis and associated with hyperuricemia and suggesting that chronic systemic inflammation and endothelial dysfunction seems to have strong bond between asymptomatic hyperuricemia and atherosclerosis.<sup>9</sup>

Present study was conducted to determine the serum uric acid level in patients with chronic plaque psoriasis and healthy controls and this study may lead to focus on early diagnosis and treatment to minimize the risk of developing co-morbidities and so reducing the mortality.

## MATERIALS AND METHODS

This was a Case control study conducted in outpatient's department (OPD) of Department of Dermatology, PNS Shifa, Karachi. Non-probability consecutive sampling technique was used.

### Sample Size

By using WHO Sample size calculator prevalence of elevated serum uric acid in cases 19%<sup>7</sup> and controlled 7%.<sup>7</sup> confidence interval 95%, power of test 80%, then the estimated sample size was at least n= 97 in each group, total sample size 194.

### Data Collection Procedure

Patients from Outpatient Department (OPD) of Dermatology PNS Shifa, Karachi, fulfilling the inclusion criteria were selected after informed and written consent and its approval was obtained from ethical committee of PNS Shifa Hospital Karachi before starting study. 5 ml of venous blood was drawn in sterile syringe and using gel sample tube was sent to the hospital laboratory for detection of serum uric acid level. These tests were done by enzymatic calorimetric reaction on fully automated chemical analyzer, cobas modular p800 (Roche /Hitachi), using Roche/Hitaachi calibrators and controls. On the basis of laboratory reports the elevated serum uric acid level in psoriatic versus controls was recorded.

## Data Analysis Procedure

Data was entered and analyzed on SPSS version 23.0. Descriptive statistics were performed on all the variables including continuous and categorical variables. For continuous variables Mean±S.D or Median & IQR was calculated depending upon the distribution of the variables i-e age, duration of disease. and confidence interval was calculated for, Frequency and percentages were calculated for categorical variables e.g gender and elevated serum uric acid level. Chi square test with confidence interval was applied to compare both groups taken, P- value≤ 0.05 was considered significant, odd ratio was calculated. Age, gender and duration of disease were stratified, chi square test was applied post stratification, odd ratio and confidence interval was also calculated.

## RESULTS

In this study one hundred and ninety four subjects were included. Out of 194, 97 patients were biopsy proven cases of psoriasis were taken as cases and 97 participants coming to OPD with any other complaint like acne, hair fall, fungal infections were taken as controls. The average age difference was insignificant between groups as presented in Table-I. In this study, elevated serum uric level was observed in 25.8% (25/97) psoriasis patients and 7.2% (7/97) in controls. Elevated serum uric level was 4.5 times (Approximate of 4.46) more common in psoriasis patients than control group (OR: 4.46 95%CI: 1.83 to 10.91) as presented in Table-II. Stratification analysis was also performed and showed that elevated serum uric acid was 5 times more likely in psoriasis patients than control group.

Variables	Case n=97	Control n=97	P-Value
	Mean±SD	Mean±SD	
Age(Years)	33.76±8.03	35.03±8.38	0.28
Duration of Disease (Years)	9.93±3.41	8.57±3.91	0.01

**Table-I. Comparison of characteristics between case and control**

	Case n= 97	Control n= 97	Total	P-Value	OR (95%CI)
Yes	25(25.8%)	7(7.2%)	32(16.5%)	0.005	4.46 [1.83 to10.91]
No	72(74.2%)	90(92.8%)	162(83.5%)		

Chi-Square=12.12 OR: CI: Confidence Interval

**Table-II. Elevated serum uric level in chronic plaque psoriasis patients and controls**

## DISCUSSION

Present study demonstrates that raised uric acid levels are observed in psoriatic patients than controls. There is strong association between cardiovascular disease (CVD) and psoriatic patients.<sup>10,11</sup> Outcome of the previously conducted studies also revealed that hyperuricemia is highly associated with features of metabolic syndrome and they may have a big role to predispose the patients cardiovascular diseases CVD.<sup>12,13</sup> The affiliation between psoriasis and hyperuricemia has been extensively studied before but the results were inconclusive.<sup>7,14</sup> The uric acid is produced as end product of purine catabolism. The hyperuricemia is involved in various conditions including psoriasis. The earlier studies<sup>15,16</sup> have given contrary results on the potential interaction between psoriasis intensity and hyperuricemia. The new data also reveals that raised serum uric acid is associated with metabolic problems.<sup>12,17</sup> In this study, elevated serum uric level is observed in 25.8% (25/97) cases and 7.2% (7/97) in control. Elevated serum uric level was 4.5 times (Approximate of 4.46) more common in cases than control group (OR: 4.46 95%CI: 1.83 to 10.91). Gisondi P et al.<sup>6</sup> showed increase uric acid level in chronic plaque psoriasis and comparing it with controls and recorded uric acid (mg/dl)  $5.61 \pm 1.6$  in chronic plaque psoriasis and  $4.87 \pm 1.4$  in controls and that showed three fold increased of serum uric acid in cases than control subjects (19% versus 7%). Increased SUAC in psoriatic patients can be attributed to common risk factors of psoriasis, obesity and other metabolic disorders.<sup>12,13</sup> and it also suggested psoriasis itself played a pivotal role in development of hyperuricemia.<sup>6</sup> Kwon et al.<sup>7</sup> revealed that in the psoriasis, elevated levels of SUA can be linked to high cell turnover of epidermal cells. Hyperuricemia lead to gouty arthritis and should not be confused with Psoriatic arthritis PsA in clinical practice.<sup>18</sup> It has also been observed that raised levels of uric acid are linked with thickening in carotid-artery internal walls in patients with PsA<sup>6</sup> and have pivotal role in accelerating both cardiovascular disease(CVD) and mortality in non-psoriatic populations.<sup>6,12</sup>

In present study elevated serum uric was five

times more likely in psoriatic patients than control group. Gisondi et al.<sup>7</sup> revealed that patients with PASI score 10 or more have uric acid levels are significantly higher as compared to those patients with PASI score less than 10 (SUA:  $5.9 \pm 1.6$  vs  $5.2 \pm 1.5$  mg/dL;  $P \leq .05$ ). Also SUA was strongly associated with BMI ( $r = 0.34$ ;  $P \leq .001$ ), and creatinine levels ( $r = 0.33$ ;  $P \leq .001$ ), serum triglyceride ( $r = 0.24$ ;  $P \leq .01$ ), but not associated with age, sex and psoriasis duration (data not shown). No significant difference was found in uric acid levels between patients with PsA and psoriasis alone (SUA:  $5.6 \pm 1.6$  vs  $5.5 \pm 1.5$  mg/dL;  $P = .60$ ).<sup>7</sup>

The association of hyperuricemia with extent of skin involvement has also been studied. Recent studies<sup>15</sup> have shown that patients with psoriasis having huge skin involvement had higher incidence of hyperuricaemia.<sup>16</sup> In recent times many of studies have shown that uric acid is associated with high risk conditions like hypertension, diabetes and obesity.<sup>5, 12</sup> It has been shown that patients with severe type of psoriasis have significant risk of developing systemic co-morbidities (coronary heart disease and metabolic syndrome).<sup>17</sup> That's why, the relationship between hyperuricemia and severity of psoriasis seems to be more complicated and clinically significant. The recent studies<sup>12, 17</sup> concerning the relationship between SUAC and psoriasis severity have been done in white populations, but haven't been taken into account like body mass index (BMI) and other metabolic parameters.

## CONCLUSION






Elevated serum uric acid level is a frequent finding in psoriatic patients and its early diagnosis and treatment may play a big part in better treatment of psoriasis. The results suggest that serum uric acid levels of patients with psoriasis may prove to be a useful tool in assessing multiple factors including disease severity.

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**AUTHORSHIP AND CONTRIBUTION DECLARATION**

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2	Deepa Mohan Lal	Statistical analysis.	
3	M. Suleman Pirzado	Paper write up	
4	Ajmal Rashid	Supervisor.	
5	Irfan Anwar	Data collection, Data analysis.	
6	Sanam Malkani	Data collection.	