A STUDY OF SERUM URIC ACID LEVEL IN PATIENTS WITH PSORIASIS

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ABSTRACT
BACKGROUND: Psoriasis is a common chronic skin disease, characterized by sharply demarcated, erythematous, scaly plaques. Several studies found correlation of the serum uric acid level with the extent of skin involvement & hyperuricemia results from increased purine synthesis from the rapid epidermal cell turnover. Further a relationship might well be expected between hyperuricemia and the extent of psoriatic skin involvement. The present study was undertaken in order to prove or disprove such an assumption. MATERIALS AND METHODS: 50 Patients diagnosed as having psoriasis and 50 age and sex matched normal healthy control were studied after taking their consent. Psoriasis patients with Psoriasis Area Severity Index (PASI) less than 10 considered as mild Psoriasis and PASI greater than 10 considered as moderate to severe Psoriasis. Blood sample was collected under aseptic precautions in plain vacutainer for Serum Uric Acid estimation. Uric acid estimation done by Uric acid-PAP method. RESULTS: In present study, the mean value of Uric acid is 5.46 ± 1.5 mg/dL in patients with PASI <10 while the mean value of Uric acid mean is 5.42 ± 2.2 mg/dL in patients with PASI > 10. The mean value of uric acid is 5.7 ± 0.57 mg/dL in controls. These results showed no significant rise in mean value of Uric acid in study group. CONCLUSION: In present study there is no significant mean difference of serum uric acid between psoriasis patients and healthy controls. Serum uric acid level does not correlate with Psoriasis Area Severity Index.

Keywords: Psoriasis, serum Uric Acid, Psoriasis Area Severity Index (PASI)

INTRODUCTION
Psoriasis is a common chronic skin disease, characterized by sharply demarcated erythematous, scaly plaques. Psoriasis is supposed to be initiated by interplay between genetic, environmental, and immunological factors. It is a chronic inflammatory skin disorder that shows exacerbations and remission attacks.

Although psoriasis can occur at any age, the mean age of onset for the first occurrence is between 15 – 20 years, with a second peak at 55 – 60 years. Psoriasis vulgaris is the commonest type of psoriasis, accounting for 90% of all cases. Other types include flexural psoriasis, guttate psoriasis, generalized pustular psoriasis, and palmoplantar pustulosis. Uric Acid: In humans, uric acid is the final breakdown product of purine metabolism. The two purines (Adenine and Guanine) are sequentially degraded by a series of enzymes to form xanthine and hypoxanthine. Both compounds are then oxidized by a final enzyme, called xanthine oxidase, to produce uric acid. A study on 265 patients by Bruce IN, Schentag CT, Gladman DD on hyperuricemia in psoriatic arthritis found there was no association between Psoriasis Area and Severity Index score and Serum Uric acid level (SUA). Serum uric acid in psoriatic arthritis is not associated with the extent of skin involvement but reflects metabolic changes. A study on 318 patients by Brenner W, Gschnait F suggested that there is no relationship between the frequency of hyperuricemia and the extent of psoriatic skin involvement, indicating that the increased epidermal turn over may not play a role in psoriatic hyperuricemia.

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It also suggested that the most reasonable explanation for elevated uric acid in psoriasis seems to be a combination of genetic predisposition and hyperalimentation. A study by P.V.S Prasad et al on study of psoriatic arthropathy found that serum uric acids levels were found to be above normal but mean value inside normal range and associated with PASI. However the study by Kwon HH et al on the correlation of serum uric acid with disease severity in 198 Korean patients with psoriasis suggested that Serum Uric acid concentration in patients with psoriasis is positively associated with PASI, extent of skin involvement for both genders independently (p<0.05 ). A study on 126 patients by Maryam Ghiasi Amir Houshang et al on serum uric acid levels in patients with psoriasis suggested that serum uric acid levels exacerbate by increases in the severity and duration of psoriasis, in psoriatic arthritis, and in patients with nonplaque type psoriasis. Eisen and Seegmiller found correlation of the serum uric acid level with the extent of skin involvement, and it has been postulated that the hyperuricaemia results from increased purine synthesis from the rapid epidermal cell turnover. A study by Goldman m. on Uric acid in the etiology of psoriasis suggested that psoriasis occurs as a result of disorder of purine metabolism and monosodium urate crystals may be responsible for the cell proliferation that is characteristic of psoriatic plaques. So careful study was undertaken in my study to resolve these conflicting reports. Aim of present study is to estimate serum Uric acid level and assess uric acid as marker of severity of disease in Psoriasis patients.

MATERIALS AND METHODS
The present study was conducted to estimate serum levels of Serum Uric Acid in patients of Psoriasis at clinical chemistry laboratory of Biochemistry department of S.S.G.Hospital and Medical College, Baroda.50 patients of 20-50 years of age group diagnosed as having psoriasis from skin &V.D. department forms the test group. 50 age and sex matched healthy volunteers forms the control group. Psoriasis patients with Psoriasis Area Severity Index (PASI) less than 10 considered as mild Psoriasis and PASI greater than 10 considered as moderate to severe Psoriasis. Subjects with known chronic diseases. i.e. Tuberculosis, Any apparent signs of acute or chronic inflammation (hepatitis, arthritis or auto immune disease), Liver or renal problems, Excessive alcohol consumption, Pregnant women were excluded from study.

The Study group were selected from outpatient section of Skin and V.D. department of S.S.G. Hospital and Medical College, Baroda. Patients were diagnosed by clinical features of psoriasis. After obtaining consent from the subject 5ml of blood sample was collected under aseptic precautions in a plain vacutainer. A Detailed history which including personal data, present complaints, past history, family history, personal history and treatment history was taken followed by physical examination. Estimation of Uric acid was done by Uricase -PAP using kit from CORAL on fully automated biochemistry analyzer Miura-300. Calibration graph was prepared as per instruction given in kit. Results were compared with controls everytime samples were run. Reference range of Uric acid: Male : 4.0 to 7.0 mg/dl and Female : 2.8 to 6.5 mg/dl. Serum Urea, Serum Creatinine and Serum SGPT were estimated to rule out involvement of liver and kidney diseases. Estimation of Serum Urea was done by GLDH method, Serum Creatinine by modified jaffe’s method and SGPT by IFCC UV Kinetic method on fully automated biochemistry analyzer.

Assessment of severity based on PASI:
Psoriasis Area and Severity Index (PASI) is the most widely used tool for the measurement of severity of psoriasis. PASI combines the assessment of the severity of lesions and the area affected into a single score in the range 0 (no disease) to 72 (maximal disease). PASI less than 10 considered as mild Psoriasis and PASI greater than 10 considered as moderate to severe Psoriasis. The body is divided into four sections (head (H) (10% of a person's skin); arms (A) (20%); trunk (T) (30%); legs (L) (40%)). Each of these areas is scored by itself, and then the four scores are combined into the final PASI. For each section, the percent of area of skin involved, is estimated and then transformed into a grade from 0 to

Figure 1: Structure of Uric Acid

![Figure 1: Structure of Uric Acid](image_url)
6.0% of involved area-grade: 0, <10% of involved area-grade: 1, 10-29% of involved area-grade: 2, 30-49% of involved area-grade: 3, 50-69% of involved area-grade: 4, 70-89% of involved area-grade: 5, 90-100% of involved area-grade: 6 Within each area, the severity is estimated by three clinical signs: erythema (redness), induration (thickness) and desquamation (scaling). Severity parameters are measured on a scale of 0 to 4, from none to maximum. The sum of all three severity parameters is then calculated for each section of skin, multiplied by the area score for that area and multiplied by weight of respective section (0.1 for head, 0.2 for arms, 0.3 for body and 0.4 for legs).

Statistical analysis was done by using t-test to find out significance of difference between two groups and correlation coefficient to find out statistical correlation between two variables and its significance.

RESULTS
In present study, 50 patients of 20-50 years of age group diagnosed as having psoriasis from skin & V.D. department formed the test group. 50 age and sex matched healthy volunteers formed the control group. In this study Higher incidence of psoriasis in age group of 41-50 years as compare to other group while men (62 %) were affected more than female (38%). The mean value of Uric acid is 5.46 ± 1.5 mg/dL in patients with PASI <10 while the mean value of Uric acid mean is 5.42 ± 2.2 mg/dL in patients with PASI > 10. The mean value of uric acid is 5.7 ± 0.57 mg/dL in controls. These results showed no significant rise in mean value of Uric acid in study group (P value >0.05).

In present study there is a no significant correlation between PASI and serum uric acid level with correlation coefficient r= 0.0876 and p value ≥ 0.05.

DISCUSSION
Psoriasis has been accepted as a multi-factorial disease with genetic susceptibility. The lesions in psoriasis develop secondary to T-cell mediated hyperproliferation of keratinocytes which is induced by antigen-presenting cells on the skin. It is widely accepted that genetic predisposition and environmental factors have a profound effect on the immune system and play a crucial role in triggering psoriatic lesion development. In this research, psoriatic patients were categorized into two main types according to severity, mild and severe psoriasis groups. In this study, 50 patients of 20-50 years of age group diagnosed as having psoriasis from skin and V.D. department forms the test group.

Table 1: Comparison of study groups

<table>
<thead>
<tr>
<th>Number of Patients</th>
<th>PASI&lt;10</th>
<th>PASI&gt;10</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (M/F)</td>
<td>21/9</td>
<td>10/10</td>
<td>24/26</td>
</tr>
<tr>
<td>Average Age (in years)</td>
<td>40.3</td>
<td>40.6</td>
<td>39</td>
</tr>
<tr>
<td>Serum Uric Acid (mg/dL)</td>
<td>5.46</td>
<td>5.41</td>
<td>5.7</td>
</tr>
<tr>
<td>Serum Urea (mg/dL)</td>
<td>24.2</td>
<td>24.7</td>
<td>25.1</td>
</tr>
<tr>
<td>Serum Creatinine (mg/dL)</td>
<td>0.86</td>
<td>0.81</td>
<td>0.84</td>
</tr>
<tr>
<td>Serum SGPT (U/L)</td>
<td>23.3</td>
<td>23.5</td>
<td>24.2</td>
</tr>
<tr>
<td>PASI</td>
<td>3.0</td>
<td>16.9</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Graph 1: Correlation of Uric acid with PASI in psoriasis patients (n=50)

In present study also we found no correlation between PASI and Serum Uric Acid level. A study by Brenner W, Gschnait F. Serum uric acid levels in untreated and PUVA-treated patients with psoriasis on suggested that there is no relationship between the frequency of hyperuricemia and the extent of psoriatic skin involvement, indicating that the increased epidermal turn over may not play a role in psoriatic hyperuricemia. They also mentioned that the most reasonable explanation for elevated uric acid

30 patients had PASI less than 10 (mild psoriasis) while 20 patients had severe psoriasis (moderate to severe psoriasis). A study by Bruce IN, Schentag CT, Gladman DD on Hyperuricemia in psoriatic arthritis found that there was no association between Psoriasis Area and Severity Index score and SUA. In present study also we found no correlation between PASI and Serum Uric Acid level.
Serum Uric acid level in patients with psoriasis

in psoriasis seems to be a combination of genetic predisposition and hyperalimentation. The present study correlate with this study. However study by Maryam Ghiasi Amir Houshang et al suggested that mean serum uric acid levels in normal range but value significantly higher in patient with more severe form of psoriasis and uric acid level exacerbate by increases in the severity and duration of psoriasis. However present study find no correlation between serum uric acid level and PASI. The small number of the patients in study and control groups is the main limitation of the present study. Additional studies with a large number of patients are needed to validate the exact pathophysioligic relationship between the psoriasis and uric acid level. So in this study there was no relationship between the frequency of hyperuricemia and the extent of psoriatic skin involvement, indicating that the increased epidermal turn over may not play a role in psoriatic hyperuricemia. The most reasonable explanation for elevated uric acid in psoriasis seems to be a combination of genetic predisposition and hyperalimentation.

CONCLUSION

In present study there is no significant mean difference of serum uric acid between psoriasis patients and healthy controls. There is no significant difference in Serum uric acid level in patients with mild and moderate to severe psoriasis patients. So Serum Uric acid level does not correlate with Psoriasis Area Severity Index.

REFERENCES

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