



Research Paper

Hyperuricemia in Nigerian Psoriatic Patients

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Received 09 April, 2016; Accepted 25 April, 2016 © The author(s) 2015. Published with open access at www.questjournals.org

ABSTRACT:-Psoriasis is a chronic papulosquamous inflammatory disorder. Increased elevation of some inflammatory agents such as uric acid has been shown to be associated with the extent of spread and severity of disease. This study seeks to find the prevalence of hyperuricemia in psoriasis and examine the impact of six weeks treatment on the serum uric acid level in psoriasis. Thirty two diagnosed psoriasis patients and fifty seven age and sex matched control group were studied. Their demographic data and serum uric acid level before and six weeks after treatment were noted and recorded. The prevalence of hyperuricemia among psoriasis group was 40.7% and 7.0% in control group and the difference was statistically significant ($p=0.0001$). Mean \pm SD of uric acid levels was $350.9 \pm 141.7 \mu\text{mol/L}$; $271.8 \pm 92.1 \mu\text{mol/L}$ in psoriasis group and control group respectively and it was statistically significant ($p=0.002$). The Mean uric acid levels were significantly reduced from $468.5 \pm 136.2 \mu\text{mol/L}$ to $310.6 \pm 75.0 \mu\text{mol/L}$ after six weeks of treatment among psoriatic patients with hyperuricemia; $p=0.001$ and $r=0.787$. There was a high prevalence of hyperuricemia among psoriasis patients when compared to control. However, a focused 6 weeks treatment of the psoriasis showed a significant improvement of serum uric acid level.

Keywords:-Hyperuricemia, psoriasis, treatment of psoriasis, serum uric acid

I. INTRODUCTION

Psoriasis is a chronic non-infectious inflammatory skin disease which affects about 0-3% of the population (1-2). It is often characterized by well demarcated, red scaly plaques with associated pruritus that shows exacerbation and remission of attacks. There is equal male and female affectation (3). The age of onset occurs in two peaks. Early onset psoriasis (16-22years of age) is commoner and often associated with family history of psoriasis. Late onset disease peaks at 55-60years of age (2, 3, 4).

Hyperuricemia is an abnormally high level of uric acid in the blood. In the pH conditions of the body fluids, uric acid exists largely as urate, the ion form (5,6). In human beings, the upper limit of the normal range is $360 \mu\text{mol/L}$ (6mg/dl) for women and $400 \mu\text{mol/L}$ (6.8mg/dl) for men (7). The amount of urate in the body depends on the balance between the amount of purines eaten in the food, the amount of urate synthesized within the body, for instance by cell turnover and quantity of urate excreted in the urine or through the gastrointestinal tract (7).

The association between hyperuricemia and psoriasis was first reported in 1930 by Hermann et al. They posited that uric acid level was above upper limit of normal in 44 out of 140 patients with psoriasis, especially in those with arthritis (8). Elevated serum uric acid levels may result from increased purine synthesis due to accelerated epidermal turnover associated with psoriasis (9). A study by Kwon et al. demonstrated a positive correlation between serum uric acid level and the Psoriasis Area Severity Index (PASI), body mass index (BMI) and, total body surface area (BSA) involved in patients with psoriasis (10).

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In another study, an increased concentration of serum uric acid was found in patients with psoriasis when compared to two other groups (patients with skin disorders other than psoriasis and a control group) and after 12 weeks of therapy, a significant reduction of mean uric acid level was observed in patients with psoriasis (11).

This study is undertaken due to the present paucity of data in this regard in our locale and we intend to determine the prevalence of hyperuricemia among psoriatic patients in North Central Nigeria and to establish if there is any reduction in the serum uric acid concentration after 6 weeks of treatment.

II. MATERIALS AND METHODS

This study was conducted over a period of three years (January 2013 and December 2015) at the Dermatology unit of Department of Medicine, University of Abuja Teaching Hospital, Gwagwalada-Abuja. Within this period, a total of thirty two (32) consecutive consented patients who were diagnosed as having psoriasis both clinical and histologically were recruited into the study. Fifty seven (57) sex and age matched control were also enrolled into the study. A proforma was developed to capture their demographic data such as: name, age, tribe, occupation, level of education, history of cigarette smoking, excessive alcohol intake and, drugs intake prior to noticing of psoriatic lesions. The onset and duration of psoriasis, percentage area of involvement of psoriasis were ($\leq 10\%$ body surface area is regarded as localized psoriasis and $> 10\%$ body surface area is regarded as generalized psoriasis) (12). Psoriasis area severity index (PASI) and the clinical type of psoriasis were all noted (13). Their serum uric acid levels were estimated using the automated analyzer sodium tungstate method and its normal laboratory range in our center (142-339 μmol for women) and 228-420 μmol for men) were recorded. Patients were regarded as having an elevated serum uric acid if their results were > 340 for women and > 420 for men. For the subjects, their uric acid levels were repeated at the six weeks of treatment. All the patients were treated with high potent topical steroid and methotrexate. The data generated were keyed into SPSS 20.0 version and analyzed. Descriptive statistics, mean, t test, paired t test and correlation were used to determine its prevalence and effect of treatment on psoriasis and a test of level of significance at $p < 0.05$ was considered significant

III. RESULT

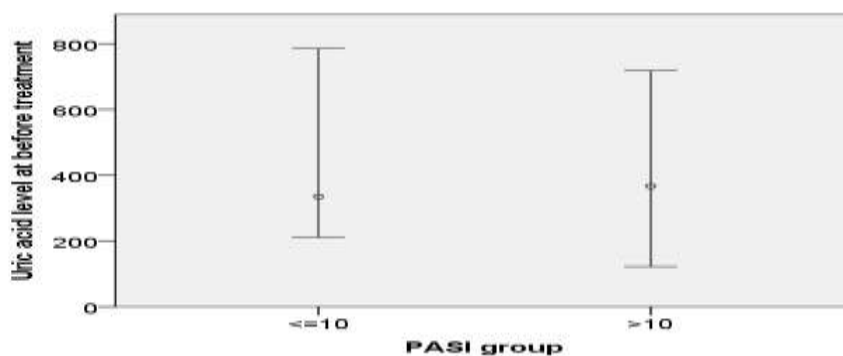
We studied 32 patients that had psoriasis and 57 age and sex matched control group. There were 18 males (56.2%) and 14 (43.8%) females in the subject group that had psoriasis and 27 (47.4%) males and 30 (52.6%) females in the control group without psoriasis. The prevalence of hyperuricemia among the psoriasis patients was (40.7%) and it was significantly higher than that of the control group 7.0% and $p < 0.0001$ [Table 1].

The mean \pm SD of serum uric acid level among psoriasis patients was $350.9 \pm 141.7 \mu\text{mol/L}$ and was significantly higher than that of the control group without psoriasis $271.8 \pm 92.1 \mu\text{mol/L}$ ($p = 0.002$). The percentage occurrence of different psoriasis include: chronic plaque psoriasis either single or combined 27/32 (84.4%), psoriatic arthritis 5/32 (15.6%), Erythroderma 3/32 (9.4%), Inverse psoriasis 8/32 (25.0%), Nail psoriasis 7/32 (21.9%), scalp psoriasis 2/32 (6.3%) and pustular psoriasis 1/32 (3.1).

Notably, four (4) out of five (5) patients that had psoriatic arthritis had elevated serum uric acid levels. Figure I and II represents Psoriasis Area Severity Index and percentage Body Surface Area involvement in relation to their mean uric acid level respectively and its mean and range of occurrence among subject group before treatment; while figure III represents mean, range of uric acid level between the subjects and the controls and $p = 0.002$.

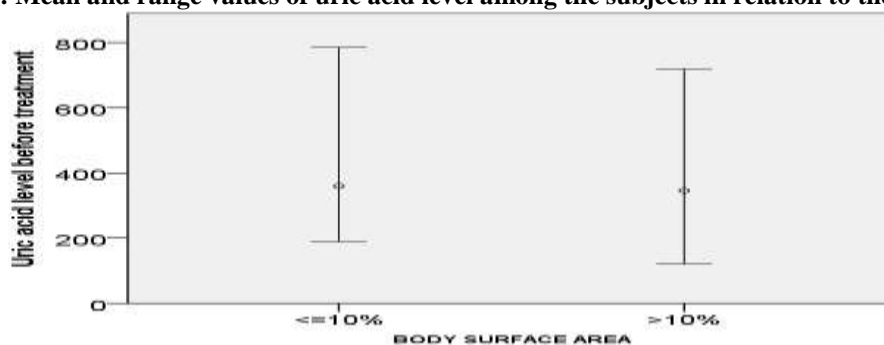
Among hyperuricemic cohorts 53.8% were females while 46.2% were males. The mean uric acid level for $\text{PASI} \leq 10$ was 498.3 μmol and $\text{PASI} > 10$ was 455 μmol respectively [Table 2]. Whereas mean uric acid level for $\text{BSA} \leq 10\%$ was 473.8 μmol and $\text{BSA} > 10\%$ was 465.1 μmol respectively. There was no significant association between PASI and BSA and hyperuricemia before treatment ($p = 0.256$; and 0.607 respectively) [Table 2].

There was a statistically significant reduction in the uric acid level before and after six weeks of treatment of psoriasis from $468.5 \pm 136.2 \mu\text{mol}$ to $310.6 \pm 75.0 \mu\text{mol}$ ($p = 0.001$). A paired test was conducted to ascertain the effect of treatment for the 32 subjects: both patients that had hyperuricemia and those with normal serum uric acid and the result showed significant decrease in the mean Uric acid level which was strongly correlated (Pearson's correlation = 0.787).



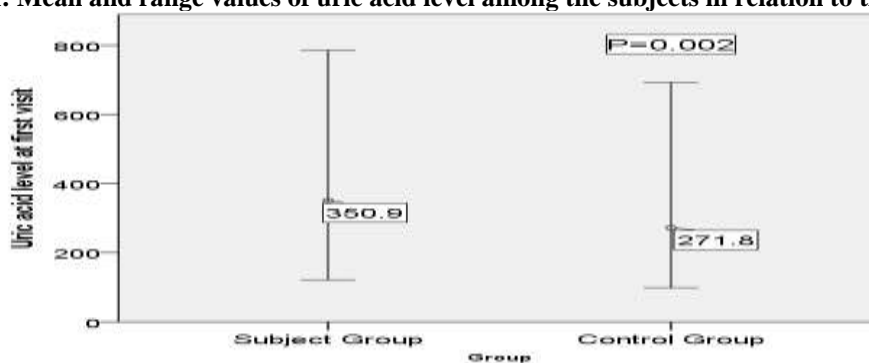
(Source: Clinic base research- University of Abuja Teaching Hospital 2015)

Figure I: Mean and range values of uric acid level among the subjects in relation to their PASI



(Source: Clinic base research- University of Abuja Teaching Hospital 2015)

Figure II: Mean and range values of uric acid level among the subjects in relation to their BSA



(Source: Clinic base research- University of Abuja Teaching Hospital 2015)

Figure III: Mean and range values of uric acid level among the subjects and control group

Table 1: General Characteristics both Subjects group with Psoriasis and control Group without psoriasis

	Subject group (n=32)	Control Group (n =57)	P value
Sex			
Male n (%)	18 (56.2)	27 (47.4)	0.280
Female n (%)	14 (43.8)	30 (52.6)	
Age (Mean ± SD)	39.8±15.2	40.4±12.0	0.838
Uric Acid Level (Mean ± SD) in µmol/L	350.9±141.7	271.8±92.1	0.002*

Hyperuricemia			
Normal n (%)	19 (59.4)	53 (93.0)	
Abnormal n (%)	13 (40.6)	4 (7.0)	<0.0001*

(Source: Clinic base research- University of Abuja Teaching Hospital 2015)

Table 2: Prevalence of hyperuricemia in Psoriatic patients

	Hyperuricemia		P value
	Normal(n=19)	Abnormal	
Sex			
Male n (%)	12 (63.2)	6 (46.2)	
Female n (%)	7 (36.8)	7 (53.8)	0.278
Age (Mean ± SD)	38.2± 15.3	42.0±15.3	0.496
Duration of eruptions (mean ± SD)	5.4±6.2	4.9±5.4	0.970
BSA			
□ 10 % n(%)	7 (36.8)	5 (38.5)	
>10% n (%)	12 (63.2)	8 (61.5)	0.607
PASI			
□ 10 % n (%)	12 (63.2)	4 (30.8)	
>10% n (%)	7 (36.8)	9 (69.2)	0.074
BSA			
□ 10 % (Mean ±SD)	7.6±2.9	7.6±2.9	0.999
>10% (Mean ± SD)	29.3±20.6	34.1±19.9	0.613
PASI (Mean ± SD)	16.0±21.1	25.3±16.9	0.256
Treatment **			
Mean UAL before treatment (Mean ± SD)	270.41±73.3	468.5±136.2	
Mean UAL after treatment (Mean ± SD)	256.7±51.9	310.6±75.0	0.0001**

(Source: Clinic base research- University of Abuja Teaching Hospital 2015)

paired t test for treatment before and after ($p < 0.0001$) and Pearson's correlation $r = 0.787$ and $P < 0.0001$ indicates that statistically there was a reduction in the mean \pm SD of the uric acid level after treatment for both patients with/without hyperuricemia significant

IV. DISCUSSION

Hyperuricemia in psoriatic patients could simply be a consequence of obesity and other coexisting metabolic disorder [15,16, 17]. Studies also have suggested that psoriasis itself might contribute directly to hyperuricemia [10,18,19]. Kwon et al and Choi et al had proposed that an increased epidermal cell turnover could be a cause of raised serum uric acid levels among psoriasis patients [10,18]. Several studies have documented a higher prevalence of hyperuricemia among psoriatic patients when compared with controls (18-20)

Our study found a prevalence of 40.7% of hyperuricemia among psoriasis patients as compared to 7.0% of the control group ($p = 0.001$). Of note was the fact that out of the five patients with psoriatic arthritis four (4) had hyperuricemia which corroborated previous findings (18, 22, 23).. The clinical import of this finding is that such patients stand a risk of developing gouty arthritis in the future if not properly monitored and managed.

We did not observe any significant relationship between hyperuricemia and Psoriasis Area Severity Index (PASI) score and percentage body surface area involvement in our patients. This was similarly observed by these studies (23-24). Although, a few researchers have observed a significant graded relationship between hyperuricemia and PASI [18,25].

Coimbra et al(11) found an increased concentration of serum uric acid in patients with psoriasis as compared to other two groups (Patients with skin disorders other than psoriatic lesions, and a control group). After 12 weeks of therapy, a significant reduction of mean uric acid level was observed in patients with psoriasis. This was similar to our findings although our patients' serum uric acid levels were repeated after only 6 weeks of treatment. They were managed for psoriasis without drugs like allopurinol and none of them had gouty arthritis.

The main limitation of our study was the relatively small number of patients. Consequently, we assert that a multicentered prospective study would help to give further insight into the relationship between hyperuricemia and psoriasis in our environment.

V. CONCLUSION

In conclusion, there was a higher prevalence of hyperuricemia among Nigerian psoriatic patients and a six weeks focused treatment would greatly improve this hyperuricemic state.

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