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## Hypertension in psoriasis and lichen planus patients – A case control study

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### Abstract

**Background:** Psoriasis and lichen planus (LP) both are chronic inflammatory disorders of the skin. The recent data shows increased prevalence of diabetes mellitus and metabolic syndrome (MS) in these patients. MS is described as a risk factor for cardiovascular disorders (CVDs). If there is increased risk of CVDs in such patients, they should be screened for blood pressure when they visit dermatology OPDs. The present study is to find out if there is any need of screening such patients for blood pressure or not.

**Objectives:** To find out the association of psoriasis and lichen planus with hypertension.

**Methods:** 60 LP patients, 60 psoriasis patients and 60 healthy individuals were selected for the study and their blood pressure was measured after taking the written informed consent.

**Results:** 33.3% of the psoriasis patients, 38.3% of LP cases and 20% of controls were found to be hypertensive. The difference was statistically significant in both psoriasis as well as LP cases compared to controls ( $p < 0.05$ ).

**Conclusion:** Blood pressure was found to be raised in LP and psoriasis patients as compared to controls.

**Keywords:** Psoriasis, lichen planus, hypertension

### Introduction

Psoriasis and LP, both are inflammatory disorders with altered T-cell expression leading to cutaneous and muco-cutaneous lesions respectively [1, 2]. Recent studies show that the immune system, autoimmunity and the inflammatory response of the body play a major role in increasing the blood pressure in the vessels [3]. As, LP and psoriasis, both have immunological aetiology with altered inflammatory response of T-cells, there might be a direct etiological relationship between hypertension and these two cutaneous disorders.

Secondly, psoriasis and lichen planus (LP) both are chronic cutaneous disorders having psychological impact on the patients [4]. Stress is one of the causes of exacerbation of these two conditions and also, the appearance of the lesions on exposed parts, pruritis associated with these diseases and their chronic nature become the reason for the stress making it a vicious cycle. This can lead to increased prevalence of hypertension in these patients.

Theoretically also, the increased prevalence of HTN in these patients could be due to many reasons -

- Angiotensin II which regulates the vascular tone also stimulates the release of pro-inflammatory cytokines when present in increased levels. In psoriasis patients, elevated plasma renin activity has been reported leading to increased release of angiotensin II [5].
- Endothelin-1 produced by keratinocytes is found in increased amount in both serum and lesional skin of patients with psoriasis as well as LP. The levels also correlate with the severity of the disease. It is a potent vasoconstrictor and may contribute to HTN in such patients [6].
- Oxidative stress, which is present in patients with psoriasis and LP, may play a role in HTN by destructive effects of reactive oxygen species, damaging endothelium-dependent vasodilatation [5, 6].
- Patient already taking treatment for HTN can get lichen planus or lichenoid lesions as side-effect of the anti-hypertensive drugs [7].

Similarly, patients having psoriatic arthritis take medications such as NSAIDs and Cox-2 inhibitors which could contribute to increased blood pressure [8]. However, these confounders had been excluded from this study as the objective was to find the direct association of these conditions with HTN.

Psoriasis and LP have been associated with various systemic and metabolic disorders [9, 10]. The recent data shows increased prevalence of metabolic syndrome (MS) in these patients [11, 12]. MS is described as a risk factor for cardiovascular disorders (CVDs) [13]. The expanding epidemiological data suggests that not only MS, but the individual components of MS including diabetes mellitus, obesity, dyslipidemia and hypertension have increased prevalence in these cutaneous disorders [9, 10, 14]. Hypertension is a major risk factor for the development of CVDs and thus, it is an important modifiable cause of premature morbidity and mortality. If there is increased risk of CVDs in such patients, they should be screened for blood pressure when they visit dermatology OPDs.

**Materials and Methods**

This is a cross sectional study comprised of 60 psoriasis patients, 60 LP patients and 60 age and sex matched controls. This was a hospital based descriptive study. The study population included psoriasis and LP patients with age ranging from 30 years to 60 years attending Out Patient Department of Dermatology Dept. Psoriatic arthritis patients, pregnant women, patients on oral steroids, retinoids, NSAIDs and those who were already taking treatment for HTN were excluded from the study. An informed consent was taken from all subjects and clinical data of each patient was recorded on a standard Performa. A detailed history including the occupation, duration of the disease, treatment taken, family history, drug intake and personal history was taken before clinical examination. Study was approved by the ethical committee of the College.

Blood pressure (BP) was recorded for all the patients. BP was recorded after subjects have been lying in supine position for five minutes.

Comparisons between patients and controls were performed by chi square analysis for qualitative variables. Odds ratios (ORs) and Confidence Intervals (CIs) were calculated with exact conditional logistic regression. A value of  $P \leq 0.05$  was considered statistically significant.

**Results**

46.67% of psoriasis patients belonged to the age group 31-40 years. LP was found more common in 41-50 years' age group (45%). In control group, 40% belonged to 31-40 years with range of 30-64 years [Table 1]. 66% of patients had LP for less than 6 months of duration. 42% of psoriatic patients were suffering from the disease since more than 1 year.

BP>140/90 mmHg was seen in 33.3% of the psoriasis patients, 38.3% of LP cases and 20% of controls [Table 2]. The difference was statistically significant in both psoriasis as well as LP cases compared to controls ( $p < 0.05$ ).

**Discussion**

Psoriasis and LP are chronic cutaneous diseases which have been linked to systemic and metabolic derangements.<sup>9-12</sup>The

present study was conducted to determine the prevalence of HTN in the patients with LP and psoriasis.

The male preponderance seen in our study correlates with other published studies, however, it could be due to more number of male patients attending the OPD. Age group wise comparison showed maximum number of cases belonged to 41-50 years similar to other studies [15].

82% of psoriasis patients presented with plaque type of psoriasis. Majority of the LP patients (72%) were found to have classical type of LP with 34% having mucosal involvement. These findings correlated with other studies [12, 13, 16].

There are many studies which show positive association between these two skin diseases and HTN. As early as in 1949, Lynch FW [17], reported apparent association of LP with hypertension but it could be due to various other factors including the medication. He found the increased prevalence of HTN in LP patients. Kim HN *et al.* [18], in a cohort study found a statistically significant association of HTN with psoriasis.

However, few studies did not show any statistically significant relationship between hypertension and these inflammatory skin disorders.

Okpala IC *et al.* [19] neither found any increased prevalence of HTN nor metabolic syndrome in LP patients. Even Christensen *et al.* [20] and Chattopadhyay A *et al.* [21] in their studies could not establish any association between LP and HTN. It could have been possible that these studies included the control group patients suffering from other inflammatory disorders of skin or the patients already prone to HTN. In present study, the control group was selected from the hospital workers and relatives visiting with the OPD patients.

Our study revealed a significant association of HTN with LP and psoriasis. As thus, timely screening of such patients is essential. These findings may help us to formulate guidelines for these patients to prevent systemic complications.

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**Table 1:** Age wise distribution of patients and control group with hypertension

Age groups	Psoriasis	Lichen planus		Control		
	No. of patients	Patients with HTN	No. of patients	Patients with HTN	No. of patients	Patients with HTN
31-40	28	8	21	7	24	3
41-50	23	9	27	11	22	7
51-60	9	3	12	5	14	2

**Table 2:** Percentage of hypertensive patients in each group

	Patients with HTN	Percentage
Psoriasis	20	33.3%
Lichen planus	23	38.3%
Control	12	20%



**Fig 1:** Genital Lichen planus



**Fig 2:** Lichen planus involving back

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