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A CLINICAL STUDY OF LICHEN PLANUS AND ITS SYSTEMIC ASSOCIATION AT TERTIARY CARE HOSPITAL

Dermatology

Neerav M. Patel* Senior Resident; Department of Dermatology Venereology & Leprosy–SMIMER, Umarwada, Surat – 10 Gujarat. *Corresponding Author

Priyanshi J. Modi 1st year Post Graduate Resident; Department of Dermatology Venereology & Leprosy – SMIMER, Umarwada, Surat – 10 Gujarat.

Jignesh B. Vaishnani Professor & Head, Department of Dermatology Venereology & Leprosy – SMIMER, Umarwada, Surat – 10 Gujarat.

ABSTRACT

Background: Lichen planus is autoimmune systemic inflammatory disease. Genetic predisposition and external factors such as Viral infection (HBV, HCV) & Drugs have been suspected as etiological factors. Lichen planus is found to be associated with various autoimmune disease such as thyroid diseases, diabetes mellitus, thymoma, chronic active hepatitis, dyslipidemia. Limited studies are available highlighting association of Lichen Planus and Systemic diseases in Indian population. **Aims:** This study was designed to know demographic and clinical profile of LP patients in Indian population and to study prevalence of different systemic diseases in LP patients. **Settings and design:** A cross sectional analytical study was done in 353 patients clinically diagnosed as LP. **Methods:** All new lichen planus patients detected between Jan-2017 to June 2022 were included in study. Detail history noted and investigated for systemic disease. Demographic Data of patient's clinical profile and systemic diseases were collected. **Result:** Highest number of patients presented in 3rd decade 87 (24.65%) followed by 4th decade 81 (22.94%). 44 (12.46%) patients had Grade 1 and 19 (5.38%) had Grade 2 obesity. 41 (11.61%) patients had Grade 1 and 5 (1.42%) had Grade 2 hypertension. 22 (6.23%) patients had high blood FBS and PPBS. 92 (26.06%) patients had high fasting cholesterol, 60 (17%) had high fasting triglyceride, 75 (21.25%) had high fasting LDL, 173 (49.01%) had low fasting HDL levels. 41 (11.61%) patients had high serum fasting TSH out of which 16 (4.53%) had clinical hypothyroidism. No case with Positive HCV serology or Chronic liver disease was found. **Conclusion:** Higher number of patients associated with Hypertension than Diabetes mellitus. Low HDL followed by High cholesterol were commonest abnormality in dyslipidemia. Hypothyroidism is less common finding compared to other associations. HCV and chronic hepatitis are not associated with LP in our study.

KEYWORDS

Hypertension, Dyslipidemia, Diabetes, Hypothyroidism

INTRODUCTION:

Lichen planus (LP), is an autoimmune inflammatory disease of the skin and mucous membranes, which is self-limiting in nature that resolve from several months to years. Classic LP is characterized clinically by pruritic, violaceous polygonal & flat papules that favor extremities. Histologically, hyperkeratosis, hyper-granulosis and irregular acanthosis, gives characteristic saw tooth epidermis with vacuolar degeneration of basal cells. There is a dense, band like lymphocytic infiltrate in upper dermis that obscure dermo-epidermal junction.[1] The etiology of LP is not fully understood, but genetic predisposition, with environmental triggers (viral infections e.g., hepatitis B & C, drugs)[2,3,4] have been suspected to be associated with LP. Lichen Planus has been found to be associated with various autoimmune diseases.[5] Including cutaneous and systemic diseases e.g., thyroid disorders (hypothyroidism, autoimmune thyroiditis)[6], diabetes mellitus[7], thymoma[8], chronic active hepatits[3], dyslipidemia[9,10]. Search for systemic diseases associated with lichen planus can help to determine early intervention needed to halt the progress of systemic disease. Limited studies are available highlighting association of lichen planus and systemic diseases in India.[4]

MATERIALS AND METHODS:

This study was carried out after approval of institutional ethics committee, at department of Dermatology Venereology & Leprosy, Surat municipal institute of medical education & research. All new patients of all age and sex visiting dermatology outpatient or referred to dermatology department from January 2017 to June 2022 were enrolled in study and detail history was noted & investigated for systemic (non-cutaneous) disease conditions. Patients not willing to participate in study and patients with lichenoid rash were excluded from study (Drug induced, Contact induced, GVHD). Brief history was taken from each patient regarding present and past complains, history of any familial disease. General examination was done in every patient with special emphasis on monitoring height, weight, BMI, blood pressure. Thorough cutaneous and systemic examination was performed in all patients; with special emphasis on skin, hair, nail and mucous membrane. Blood investigation was carried out as per the standard recommended evaluation of Lichen Planus which include CBC, FBS, PP2BS, SGPT, serum lipid profile, serum thyroid profile and serological test for HBV and HCV infection. After getting results data was compared with 40 controls who came for medical fitness certificate.

RESULTS:

A total of 353 cases of LP were detected between January 2017 to June 2022. Out of 353 cases, 192 (54.39 %) were male and 161 (45.61 %) were female. Male to female ratio was (M: F) 1.18:1. 87 (24.65%) patients were between age group 20-29 years followed by 81 (22.94%) in 30-39 age group. Maximum number of male patients 52 (14.73%) were between 20-29 years and female patients 37 (10.48%) were between 40-49 years. Mean age of patients was 31.19 years. Maximum number of patients 128 (26.26%) were students. Most common occupation was housemaker (31.16%) followed by 58 (16.43%) patients employed in textile, diamond and other chemical industries.

Out of 181 (51.27%) cases of high BMI, 118 (33.43%) had overweight, 44(12.46%) had Grade 1 obesity and 19 (5.38%) had Grade 2 obesity. BMI was (P value=6.97E-08) which was statistically significant. Classical type (43.06%) LP is most common form of lichen planus with mean age of 31.60 years, followed by eruptive type (20.40%) with mean age of 26.34 years, followed by Mucosal (10.76%) and hypertrophied type (9.91%). Duration of lesion were maximum (0-3) months in 191 (54.11%) cases followed by (3-6) in 76 (21.53%) cases and >12 months in 45 (12.75%) cases. 27 (7.65%) of classic LP and 16 (4.53%) patients had past history of either covid-19 infection or covid vaccination. Out of 13 cases with positive family history of systemic disease, 8 had DM & 8 had HTN and 1 had Hypothyroidism.

41(11.61%) (22 males 19 females) patient were prehypertensive, 41 (11.61%) (16 males and 25 females) had Grade 1 Hypertension and 5 (1.42%) (2 males and 3 females) had Grade 2 hypertension. Mean age of Hypertensive patient was 43.72±11.90 years. Mean age in females were more 46.29±12.37 than males 40.56±10.61 years. 22 (6.23%) (10 males 12 females) had elevated FBS and PPBS blood sugar levels. 9 patients already had past history of DM. 13 patients were newly diagnosed diabetic patients. FBS levels were (P value=0.043226) which was statistically significant. Mean age of Diabetic patients was 44.62±15.71 years. Mean age in males was more 47.54±12.26 years than females 42.15±15.43 years.

233(66%) (132 males and 101 females) had one or more abnormal lipid levels. 23 (6.51%) patients had isolated elevated Triglyceride levels out of 60 patients of High fasting triglyceride. Levels of Cholesterol (P value=6.35E-05), Triglyceride (P

value=0.007549),HDL (P value=2.9453E-06) and LDL (P value=8.28821E-15) were statistically significant. 41 (11.61%) patients had elevated fasting serum TSH, out of which 16 (4.53%) patients also had low fasting serum free T3 and T4 levels. 1 female patient was already suffering from hypothyroidism. 15 patients were of newly diagnosed hypothyroidism. TSH levels (P value=0.000325) were statistically significant. No patient was found positive with HBV or HBC virus infection in our study.

Table 1: Systemic association in our study

SYSTEMIC ASSOCIATION IN PATIENTS OF LICHEN PLANUS (N=353)			
Systemic disease	Male (%)	Female (%)	Total (%)
High blood pressure	40 (11.33%)	47 (13.31%)	87 (24.64%)
High fasting and post prandial blood sugar	10(2.83%)	12(3.40%)	22 (6.23%)
High cholesterol	49 (13.88%)	43(12.18%)	92(26.06%)
High Triglyceride	32 (9.06%)	28 (7.93%)	60(17%)
High LDL	39 (11.05%)	36 (10.20%)	75(21.25%)
Low HDL	102 (28.89%)	71 (20.11%)	173(49.01%)
High TSH	22 (6.23%)	19 (5.38%)	41 (11.61%)
High TSH & Low T3, T4	8 (2.26%)	8 (2.26%)	16 (4.53%)
High SGPT	10 (2.83%)	08 (2.26%)	18 (5.10%)

DISCUSSION:

Lichen planus being autoimmune disease thought to be more common in woman. [10] In present study there is slight male predominance with male to female ratio was 1.18:1. high number of cases presented in 3rd decade (25.71%) followed by 4th decade (20%), suggesting its prevalence is more common in adult population which was comparable to some previous studies. [11,12]

Classic subtype was most common followed by Eruptive LP. Increased prevalence of eruptive LP in our study compared to other subtypes maybe due to ongoing pandemic with covid infection and immunogenic effect of vaccine on people.

In our study mean BMI was 25.38$\pm$5.34 kg/cm^2 which slight greater than mean BMI in study (24.3kg/cm^2) done by Bikash Ranjan Kar et al.[13] high BMI was more common in female patients 93(26.34%) with Lichen Planus than male patients 88 (24.92%).

13 (3.68%) patients have positive family history of chronic systemic disease (DM, HTN, Asthma). Contrast to study done by Bermejo-Fenoll A et el our study didn't find any significant association with family history of lichen planus.[14]

45 (27.95%) out of 48 females in study has history of either menopause or hysterectomy with oophorectomy. In study done by Mohan RPS et al also had 10.91% of LP patients in postmenopausal age group. Post-menopausal hormonal disturbances may play role in causation of lichen planus.[15]

87 (24.64%) patients had blood pressure more than reference range as per JNC guideline. results are comparable with study done by Salvador et al[16] showing high proportion of hypertension in lichen planus patients. Out of 87 patients 13 already had past history of hypertension. 74 (20.96%) were newly diagnosed patient with hypertension.

22 (6.23%) females were diabetic according to reference range according to Harrison's principal of internal medicine 19th edition. It was comparable to case control study done by Bikash Ranjan Kar et al.[13]

Total 233 (66.01%) patients had one or more abnormal fasting blood lipid levels. Dyslipidemia present in LP patients in our study was also comparable study done by Bikash Ranjan Kar et al and Salvador et al with exception of serum fasting Triglyceride. Study done by Bikash Ranjan Kar et al[13] showed mean of FBS, Cholesterol, LDL, TG and HDL were significantly associated with LP patients which was comparable to our study. Chronic inflammation has significant role in development of dyslipidemia. Patients with chronic systemic disease shows increased level of TG, LDL, Cholesterol and decreased level of HDL. These changes in lipid levels positively correlate with cytokines. Cytokines such as TNF-, IL-2, and IL-6 have been implicated in increased serum lipid level in patients of chronic systemic disease. IL-6 cytokines are linked with dyslipidemia. In lichen planus cytokines like TNF- , IL-6, IL-10 and IL-4 are involved in pathogenesis of LP.[17] So, in patients of LP presence of high level of such cytokines suggest that lichen planus can be associated with dyslipidemia.[16] According to Sharrett et al higher values of TG and low levels of HDL were associated with the transition from atheroma to atherosclerosis.[18] Thus, dyslipidemia can lead to subclinical cardiovascular disease. Isolated elevated TG levels maybe due to familial hypertriglyceridemia.

41 (11.61%) patients had high serum fasting TSH. Out of these 2 (0.57%, n=353) patients were known case of hypothyroidism, 14 (3.97%, n=353) were diagnosed as having clinical hypothyroidism during study and remaining 25 (7.08%, n=105) patients can be classified as having subclinical hypothyroidism. This data suggests that there is high prevalence of hypothyroidism in lichen planus and was comparable with study done by Maria et al.[19]

In present study we found no any case of LP with Positive HCV serology. This data was comparable to studies done in India on lichen planus and HCV virus association.[20]

In our study total 18 (5.10%) patients had high serum SGPT levels, but further investigation of full liver function test and USG shows no any evidence of any chronic liver disease. This finding was contrast to study that suggest that chronic liver disease and lichen planus are associated[21] and comparable to Indian study which shows no association of LP patients with liver diseases.[22]

Table 2: Comparison of systemic abnormalities

No. of patients	Our study	Bikas Ranjan et al
BMI (kg/cm2)	25.38+5.34	24.3+2.1
Cholesterol (mg/dl)	165.79+47.02	200.3+17.8
Triglyceride (mg/dl)	108.22+49.94	151.6+24.4
LDL (mg/dl)	111.32+25.10	117.4+13.3
HDL (mg/dl)	40.33+8.97	42.4+6.1
Fasting sugar (mg/dl)	103.38+23.37	96.0+6.3

CONCLUSION:

There is slight male predominance in present study. Higher numbers of LP cases are associated with hypertension and pre-hypertension. So, screening of all LP patients for hypertension is required for early diagnosis, and appropriate treatment intervention for prevention of complication associated with overt hypertension. Diabetes mellitus and Dyslipidemia is associated with LP, either as an isolated occurrence or as a part of metabolic syndrome. Early diagnosis of DM or dyslipidemia can help to identify patients suffering from metabolic syndrome and patients with high risk of developing cardiovascular disease which in turn leads to early and appropriate management and prevention of complications associated with metabolic syndrome and cardiovascular disease. Hypothyroidism is associated with LP though less common, but screening and early diagnosis and appropriate management of hypothyroidism prevents complications associated with thyroid diseases. HCV infection prevalence and chronic hepatitis was absent in patients of LP in present study. Immunogenic effect of Covid infection and its vaccine should be studied for its relation with LP occurrence.

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