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Original Article

Frequency of dyslipidemia in patients with lichen planus

Zunaira Arshad, Madiha Sanai, Wajeeha Nusrat, Mahe neema Asghar, Aisha Ghias, Atiya Arshad, Shahbaz Amaan, Muhammad Nadeem

Department of Dermatology, KEMU/ Mayo Hospital, Lahore.
Department of Dermatology, FJMU/ Ganga Ram Hospital, Lahore.

Abstract

Background Lichen planus is a chronic T-cell-mediated inflammatory disorder, where inflammation produces lipid metabolism disturbances and is therefore linked to increase in cardiovascular (CV) risk due to dyslipidemia. Increased reactive oxygen species and lipid peroxides have also been implicated in its pathogenesis.

Objective To determine the frequency of dyslipidemia in patients with lichen planus.

Methods In this cross sectional study 96 clinically diagnosed cases of lichen planus were included. Presence or absence of dyslipidemia was decided by the recorded parameters i.e. fasting lipid profile.

Results Mean age of the patients was 37.07±11.22 year. There were 47 males (49.0%) and 49 females (51.0%). Dyslipidemia was recorded in 38 patients (39.6%). Stratification with regard to age, gender, BMI, duration of disease and history of treatment was carried out.

Conclusion Lichen planus was significantly associated with an increased risk of dyslipidemia.

Key words
Lichen planus, dyslipidemia, BMI.

Introduction

Lichen planus is a chronic, inflammatory mucocutaneous disease characterized by violaceous flat topped polygonal papular eruption predominantly on flexor aspects of body.[1] Overall incidence of lichen planus is 0.4-1.9%, predominantly affecting the middle aged females.[2] Current literature considers lichen planus to be an autoimmune process involving a delayed hypersensitivity reaction and thus producing T cell mediated inflammation.[2] The chronic inflammatory nature of lichen planus is also thought to predispose patients to other diseases with an inflammatory component, the most notable being cardiovascular disorders. This concept is supported by studies showing that lichen planus is associated with risk factors for dyslipidemia and possibly other components of metabolic syndrome.[3,4]

Dyslipidemia is a combination of raised triglycerides and low HDL cholesterol levels.[5] Chronic inflammation in lichen planus causes disturbances in lipid metabolism.[6,7] Prolonged dyslipidemia enhances the formation of atherosclerotic plaques and thereby augments the risk of cardiovascular disease in such patients.

Increased cardiovascular risk due to

Address for correspondence
Dr. Zunaira Arshad
Department of Dermatology,
KEMU/ Mayo Hospital, Lahore.
Email: arshadzunaira@gmail.com

dyslipidemia in patients suffering from lichen planus has been reported in several studies.[3,8,9] Dyslipidemia was reported in 42.5% patients with lichen planus by Dreiher J.[2] This study was aimed to determine the frequency of dyslipidemia in patients with lichen planus, among the local population as no study has been conducted to ascertain the magnitude of problem in our community. This will help in early identification and modification of the cardiovascular risk in patients with lichen planus in order to reduce mortality and long-term morbidity among such patients.

Patients and Methods

The present study was a cross sectional study carried out in Department of Dermatology unit II, King Edward Medical University/Mayo Hospital, Lahore. 96 patients, aged 16-60 years, clinically diagnosed as lichen planus of <2 years disease duration, regardless of treatment status were enrolled. Pregnant or lactating women were excluded. Obese patients with BMI >30, smokers and alcoholics were also not included in the study. Patients with familial hyperlipidemias, concomitant medical ailments like chronic liver and kidney disease, diabetes, hypertension, established coronary heart disease and patients taking tricyclic antidepressants, lipid lowering drugs e.g. statins and niacin were not enrolled. Patients having drugs causing lichenoid eruption like gold salts, quinine, thiazide diuretics, beta blockers, isoniazid and tetracyclines were omitted from this study.

Data collection and analysis

After approval from hospital ethical committee ninety six patients, diagnosed clinically with lichen planus were enrolled from the outpatient Department of Dermatology Unit II, Mayo Hospital, Lahore. The study was not funded by any source. An informed consent was taken from all patients. The demographics including name, age, detailed history and relevant examination were recorded on a specially designed proforma. Included patients were assessed for dyslipidemia by lab parameters of fasting lipid profile (sample taken after 12 hours of fasting). Presence or absence of dyslipidemia was decided by the recorded parameters which were raised triglycerides >150mg/dl(1.7mmol/L) and reduced HDL cholesterol <35mg/dl (0.9 mmol/L) in males, <39 mg/dl (1.0 mmol/L) in females. Factors that may influence the study results e.g. age, gender, BMI and duration of disease were identified and stratification of data was performed to address them.

The statistical analysis was conducted using SPSS version 20. Simple descriptive statistics were used to analyze the study variables like gender and age. Mean and standard deviation for numerical variables like age, frequency and percentage for qualitative variables like gender were used. Presence of dyslipidemia among the sample patients was presented as frequency and percentage. Data was stratified for age, gender and duration of disease to address the effect modifiers. Post stratification chi-square test was applied to calculate the significance. P value $\leq$ 0.05 was taken as significant.

Results

A total of 96 patients were included during the study period of six months. All the patients enrolled completed the study. Mean age of the patients was 37.07±11.22 year. There were 47 males (49.0%) and 49 females (51.0%). Mean BMI was 24.78±2.73 (kg/m^2) and mean duration of disease was 14.01±5.05 (month). Treatment history was given by 55 patients (57.3%). Dyslipidemia was observed in 38 patients (39.6%) **(Table 2)**. Stratification with regard to age, duration of disease, BMI and history of treatment was carried out and is presented in

Table 1 Stratification of Dyslipidemia for age.

Age	*Dyslipidemia*		*Total*	*P value*
	Yes	*No*		
18-40	13	47	60	P<0.001
41-60	25	11	36	
Total	38	58	96	

Table 2 Stratification for gender.

Gender	*Dyslipidemia*		*Total*	*P value*
	Yes	*No*		
Male	20	27	47	P=0.560
Female	18	31	49	
Total	38	58	96	

Table 3 Stratification for duration of disease.

Duration (month)	*Dyslipidemia*		*Total*	*P value*
	Yes	*No*		
≤ 10	1	28	29	P<0.001
> 10	37	30	67	
Total	38	58	96	

Table 4 Dyslipidemia stratification for BMI.

BMI (kg/m^2)	*Dyslipidemia*		*Total*	*P value*
	Yes	*No*		
< 25	9	44	53	P<0.001
≥ 25	29	14	43	
Total	38	58	96	

Table 5 Stratification for treatment history.

Treatment history	*Dyslipidemia*		*Total*	*P value*
	Yes	*No*		
Yes	22	33	55	P=0.923
No	16	25	41	
Total	38	58	96	

Tables 1-5. P value ≤ 0.05 was taken as significant. Dyslipidemia was observed more in older patients, with a BMI greater than 25 and having longer disease duration (>10 months). However there was no significant relationship with gender and previous treatment history.

Discussion

Lichen Planus is a mucocutaneous, chronic inflammatory disease with an unknown etiology but may be caused by a T-Cell mediated immunological response.[4] Chronic inflammation can lead to disturbances in lipid metabolism. Dyslipidemia has been found to play a key role in the development of cardiovascular risk.[8] Lichen planus has been associated with dyslipidemia.[4,8] Several studies revealed that diabetes and hypothyroidism have also been associated with lichen planus as well as dyslipidemia.[10,11]

Psoriasis, another immune mediated disease with inflammatory component, has been reported to be associated with increased cardiovascular morbidity in context of development of dyslipidemia and metabolic syndrome in a milieu of ongoing chronic inflammation.[12] Several cytokines as TNF alpha, IL-2 and IL-6 have been implicated for the increased lipid levels in these patients. Likewise, Lichen planus is an immune mediated chronic inflammatory disease in which antigens, yet unknown, are presented to T-lymphocytes. These Stimulated T-lymphocytes in turn attack keratinocytes, resulting in generation of multiple cytokines, reactive oxygen species as well as recruitment of more cytotoxic lymphocytes. The inflammatory cytokines produced during this lymphocytotoxic process including TNF alpha and interleukins like IL-2,4,6 and 10 etc. could potentially explain the association between lichen planus and development of dyslipidemia.[2,4,6] Chronic inflammation has been proposed as an important potential component in the pathogenesis of lipid derangements and metabolic syndrome, therefore similar to psoriasis long standing inflammation in lichen planus can be a marker for dyslipidemia.[2,3,9]

Increased cholesterol and very low density lipoprotein cholesterol (VLDL-c) along with hypertriglyceridemia enhances the formation of atherosclerotic plaques and has been considered as a sensitive predictor for cardiovascular risk.[7] Santiago *et al.* reported that lipid profile derangements are found to be more common in patients with lichen planus relative to control group.[3] Lai *et al.*, Kuntoji V *et al.* and Özkur E *et al.* also showed that LP was significantly

associated with a raised total cholesterol as well as higher triglyceride levels.[13,14,16,17] Khan S *et al.* also demonstrated dyslipidemia in lichen planus patients as compared to healthy controls[15].

In current study, dyslipidemia was observed in 39.6% patients which is comparable to the findings of drieher *et al.*, as they demonstrated dyslipidemia in 42.5% patients of lichen planus.[2] The limitaion of our study was disease duration which may effect the outcome.

Conclusion

In conclusion, this study demonstrated that LP was significantly associated with an increased risk of dyslipidemia. For patients presenting with LP, physicians should be cognizant of this association and consider early screening for dyslipidemia to reduce the incidence of cosequent cardiovascular events.

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