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Full Length Research Paper

Lichen Planus Not Associated With Hyperlipidemia

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Lichen Planus (LP) is a chronic, inflammatory, autoimmune disease that affects the skin, oral mucosa, genital mucosa, scalp and nails. LP lesions are described using the six P's (planar [flat-topped], purple, polygonal, pruritic, papules and plaques). Onset is usually acute, affecting the flexor surfaces of the wrists, forearms, and legs. The lesions are often covered by lacy, reticular, white lines known as Wickham striae.

Keywords: Lichen Planus, hyperlipidemia, dyslipidemia, cholesterol.

INTRODUCTION

Lichen planus (LP) is a chronic, inflammatory, autoimmune disease that affects the skin, oral mucosa, genital mucosa, scalp and nails. LP lesions are described using the six P's (planar [flat-topped], purple, polygonal, pruritic, papules and plaques). Onset is usually acute, affecting the flexor surfaces of the wrists, forearms, and legs. The lesions are often covered by lacy, reticular, white lines known as Wickham striae (1)

The exact cause of LP is not very clearly understood. It was found immunologically mediated diseases. Some triggers are clinically found to be responsible for it. There are obvious links with the facts such as drugs, stress, genetic tendency, environmental allergens, food allergens and systemic illness (2)

Patients with extensive LP seem to be more likely to have a hepatitis C virus infection. However, it is unclear if this virus is the cause of LP in such situations (3). Others reported the association of an LP with oxidative Stress, Diabetes Mellitus, and eventually with dyslipidemia (4, 5, and 6).

Studies in Psoriasis were found in association with increased cardiovascular risk factors, including hypertension, diabetes, obesity, and dyslipidemia, which Several cytokines as Tumor Necrosis Factor- α (TNF- α), Interleukin 2 (IL-2) and Interleukin 6 (IL-6) have been implicated in the increased lipid levels in these patients (7).

Psoriasis and LP are similarly chronic inflammatory skin disorders. The authors proposed that LP may be associated with these risk factors. Some studies in cases of LP proved this

association as inflammation produces disturbances of lipid metabolism such as increase of serum triglycerides (TG) or decrease of high density lipoprotein cholesterol (HDL-C). These lipid disturbances linked to chronic inflammation participate in the increase of cardiovascular risk associated with dyslipidemia. Chronic inflammation in patients with LP may explain the association with dyslipidemia. Lipid level screening in men or women with LP may be useful to detect individuals at risk and start preventive treatment against the development of cardiovascular disease (6).

Methods

Twenty patients with LP and 20 healthy controls with other skin diseases other than LP. Assessment lipid profile including (Total C, TG, HDL-C & LDL-C) for patients to correlate if dyslipidemia is a cause of LP lesions.

Results

The present study was performed on 40 persons ranging from 27:72 years old. They were divided into two groups; the first group included 20 patients with LP, their ages ranged from 28-72 years old, their BMI ranged from 26:3:46 and they were 14 females and 6 males. The second group included 20 healthy controls, their ages ranged from 27:55 years old, their BMI ranged from 25:46 and they were 15 females and 5 males.

Hyperlipidemia has been linked lately to Lichen Planus and that it affects the severity of lichen Planus. We have followed our patients for a long time and we concluded that the Lichen Planus severity is not affected by dyslipidemia.

Conclusions

From our results we can conclude no association of dyslipidemia in LP patients.

Aim of the work

The aim of this work is to assess the serum lipid levels in men and women with Lichen Planus excluding LP like eruption and treatment for LP such as systemic corticosteroids, retinoid acid or methotrexate and compare results with healthy controls in an attempt to find the association between Lichen Planus and dyslipidemia.

Patients and Methods

This study was carried out at the patient clinics of Dermatology and Venereology Department, Faculty of Medicine, Zagazig University Hospitals in the period from December 2011 till October 2012. It was applied on forty persons ranging from 27-72 years old. They were divided into two groups.

The first group included 20 patients with LP, their ages ranged from 28-72 years old, their BMI ranged from 26.3:46 and they were 14 females and 6 males.

The second group includes 20 healthy controls with other skin diseases other than LP (mainly nevi, melasma and verruca). Their ages ranged from 27-55 years old, their BMI ranged from 25:46 and they were 15 females and 5 males. The study had the approval of The Institutional Review Board (IRB) at Zagazig University.

Inclusion criteria:

- Men and women were older than 18 years old.
- Presence of LP affecting the skin and/or mucosa and signing of informed consent to study participation.

Exclusion criteria:

- Patients younger than 18 years old.
- Patients with lichenoid drug eruption.
- Patients receiving treatment for LP such as systemic corticosteroids, retinoid acid or methotrexate.
- Patients receiving hypocholestrimic drugs.
- Patients with other autoimmune diseases.
- Patients with familial hyperlipidemia and cardiovascular disease.

Full history was taken from each case including:

- Personal history (name, gender, age, weight and height).
- Present history which included onset, course and duration of disease, receiving treatment for LP such as systemic corticosteroids, retinoid acid or methotrexate, receiving any drugs cause lichenoid drug eruption and/or hypocholestrimic drugs.
- Past history of systemic diseases (e.g autoimmune diseases, familial hyperlipidemia and cardiovascular disease).

Measurement of body mass index (BMI)

Body mass index (BMI) was calculated by: Measuring the height and weight with subjects wearing light clothing, then

dividing body weight in kilograms by the square of the height in meters.

$$\text{BMI} = \frac{\text{Weight in kg}}{\text{Height in meters}^2}$$

All patients were subjected to:

- A general examination for detection of any systemic disease.
 - Dermatological examination was made to assess the type of LP (skin, oral mucosa, genital mucosa, hair and nail).
 - Diagnosis of LP based on clinical findings and biopsy.
- In this study there are thirteen patients with classic LP affecting the skin only. One of them was a female patient with actinic LP, another case of them was a female also associated with lichen planopilaris, four patients with mucosal LP affecting the oral mucosa only with chronic course of the disease. Finally, three patients have LP in both skin and oral mucosa.

Collection of samples

Venous blood (10 ml) was taken from all studied groups after the subject rested at least 15 minutes between 8 and 9 a.m. after a 12-14 hour fasting period. Lipid profile, including (Serum total cholesterol, Triglyceride, HDL-C and LDL-C) were studied in samples drawn in plain (without additives) tubes and centrifuged at 4000 RPM for 10 minutes. Moreover, total cholesterol /HDL-C and LDL-C/HDL-C was calculated. These data were collected before starting systemic treatment for the disease to avoid dyslipidemia associated with treatment.

The presence of dyslipidemia was defined if one of the following parameters were present: TG > 150 mg/dl, Total C > 200 mg/dl, LDL-C > 130 mg/dl, HDL-C < 40 mg/dL based on the National Cholesterol Education Program Adult Treatment Panel III definitions (1).

Principle of the test

Assessment lipid profile, including (total C, TG, HDL-C and LDL-C) using an auto-analyzer (Vital Scientific, Netherlands).

Statistical methodology

Collected data were presented in tables and suitable graphs and analyzed by the SPSS/PC software using appropriate statistical methods.

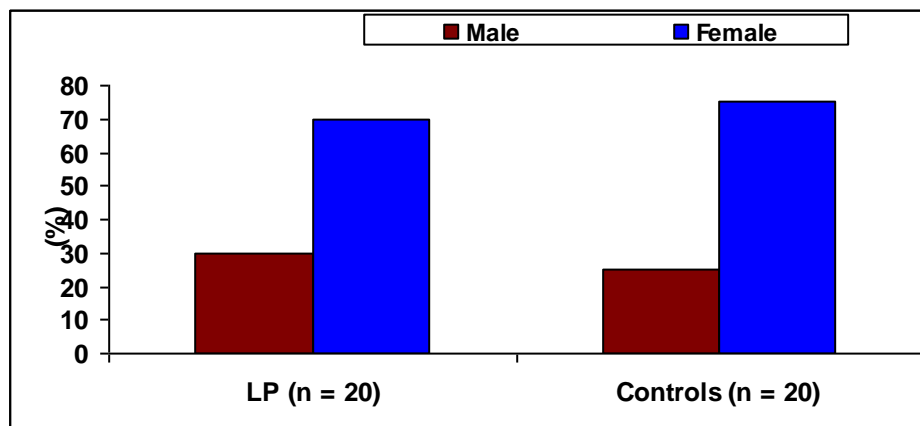
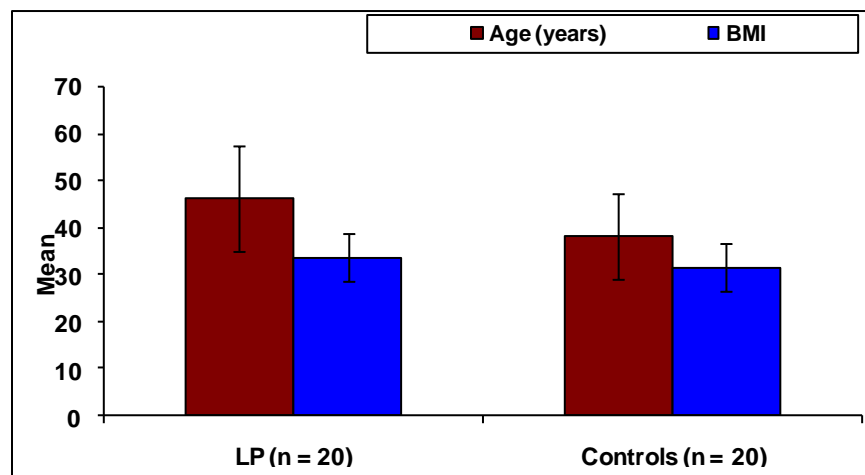
Results

The present study was performed on 40 persons ranging from 27:72 years old. They were divided into two groups: The first group included 20 patients with LP, their ages ranged from 28:72 years old, their BMI ranged from 26.3:46 and they were 14 females and 6 males. The second group included 20 healthy controls, their ages ranged from 27:55 years old, their BMI ranged from 25:46 and they were 15 females and 5 males.

As in table (1) and figure (1,2) there were statistically no significant differences between LP patients and controls as regards gender and BMI distribution. While there is a significant difference in age was found between LP patients and controls.

Table 1: Characteristic of The study groups

	LP (n = 20)		Controls (n = 20)		X ²	P
	No	%	No	%		
Gender						
Male	6	30	5	25	0.13	0.72 (NS)
Female	14	70	15	75		
Age (years)						
Mean \pm SD	46.2 \pm 11.3		38.2 \pm 9.1		t =	0.017 (S)
Range	28-72		27-55		2.47	
BMI						
Mean \pm SD	33.7 \pm 5.2		31.6 \pm 5		t =	0.18 (NS)
Range	26.3-46		25-46		1.34	

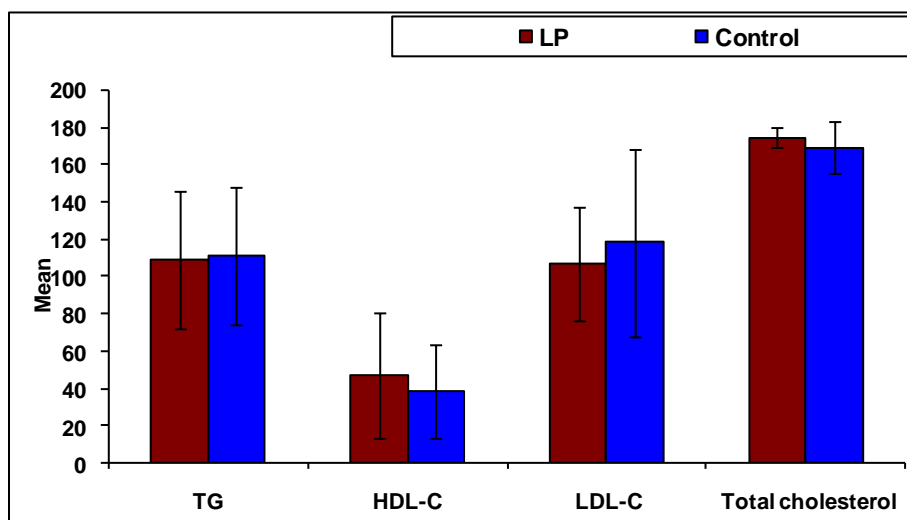
**Figure 1:** Percentage of gender in both studied groups**Figure 2:** Show the difference between the two groups of the study regarding age and BMI

Triglycerides, HDL-C, LDL-C and total cholesterol are listed in table (2). Patients with LP presented higher non-significant HDL-C values (47.5 versus 38.8 mg/dl) ($p = 0.21$) and higher total cholesterol values, but did not reach the statistical significance (174.7 versus 169.5 mg/dl) ($p = 0.65$). Controls

presented higher non-significant triglyceride values (111.2 versus 109.2 mg/dl) ($p = 0.85$) and higher non-significant LDL-C values (118.4 versus 107.1 mg/dl) ($p = 0.26$).as in table (2) and figure (3).

Table 2: Lipid profile in patients and controls

TG	LP	Control	T	P+
Mean \pm SD	109.2 \pm 36.9	111.2 \pm 33.7	0.18	0.85
Range	59.9-181.4	57-180.4		(NS)
HDL-C				
Mean \pm SD	47.5 \pm 30.2	38.8 \pm 5.6	1.26	0.21
Range	14-126	30-50		(NS)
LDL-C				
Mean \pm SD	107.1 \pm 37	118.4 \pm 25.4	1.12	0.26
Range	51-177	86-172		(NS)
Total cholesterol				
Mean \pm SD	174.7 \pm 50.3	169.5 \pm 13.5	0.45	0.65
Range	105-273	150-200		(NS)

**Figure 3:** Comparison between study groups as regards lipid profile**Table 3:** TC/HDL-C ratio and LDL-C/HDL-C ratio in LP patients and controls

	LP	Control	T	P
TC/HDL-C				
Mean \pm SD	4.15 \pm 1.4	4.4 \pm 0.62	0.79	0.43
Range	1.8-7	3.6-6.4		
LDL-C/HDL-C				
Mean \pm SD	3 \pm 1.7	3.1 \pm 0.9	0.23	0.81
Range	0.9-8	2.1-5.3		

Total cholesterol/HDL-C Values and LDL-C/HDL-C values are listed in table (3). Controls presented higher non-significant total cholesterol/HDL-C (4.4 versus 4.15 mg/dl) ($p = 0.43$) and

higher non-significant LDL-C/HDL-C (3.1 versus 3) ($p = 0.81$) as in table (3) and figure (4).

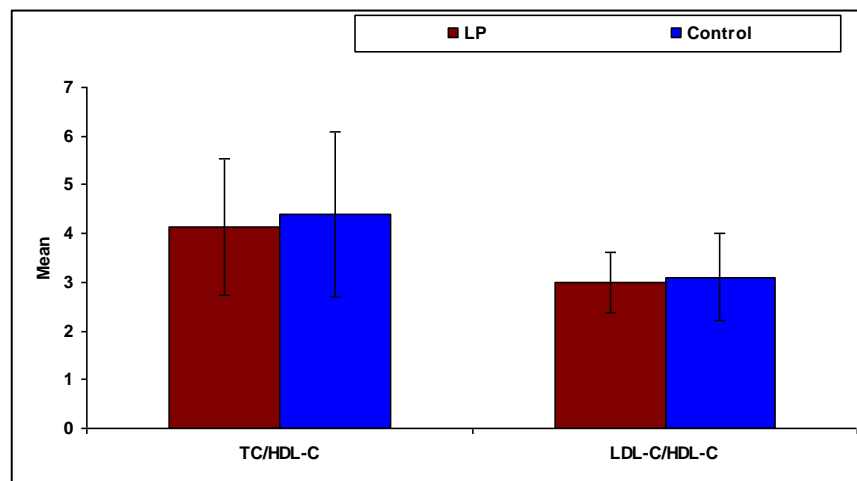


Figure 4: Comparison between TC/HDL-C Ratio and LDL-C/HDL-C ratio in different studied groups

Discussion

Lichen planus (LP) is a chronic inflammatory disease that affects the skin, genitalia, mucous membranes or appendages (8). The prevalence of LP in the general population varies depending on the population. It occurs mostly over 45 years old and is more common among women (9).

The cause of LP remains unknown, but cell mediated immune dysfunction is implicated in the disease's complex etiopathogenesis. The immunologic process results in vacuolar degeneration, lysis and liquefaction of the basal cells. The large number of cytokines released by keratinocytes and the associated inflammatory elements plays a key role in the selective recruitment of the T lymphocytes. T cell dominated infiltrate induces further release of chemokines and cytokines belonging to either the T helper-1 or T helper-2 groups (10). On the other hand, (11) found elevated concentrations of IL-2, IL-6, IL-10, TNF- α and TGF- β in LP patients.

As it has been suggested that chronic inflammation may be a component of the MS, these inflammation processes could potentially explain the link between LP and dyslipidemia and possibly other components of the MS (12). (13) Stated that higher values of TG and low levels of HDL-C were associated with the transition from atheroma to atherothrombosis and therefore control of these two CV risk factors is essential in patients with subclinical disease.

Clinical study of plasma lipids in patients with LP should be performed not only for the sake of diagnosis and treatment, but also for prevention given that atherosclerotic lesions start to appear at an early age and accelerate with the presence of other risk factors. In order to establish priorities with regard to intervention in patients with dyslipidemia it is necessary to stratify CV risk. Concomitant dyslipidemia and other risk factors such as arterial hypertension, diabetes, smoking, or renal disease are frequent and markedly increase CV events. Initiatives to establish evidence supporting the dyslipidemia hypothesis in LP patients could result in the possibility of assessing CV risk (14).

For this purpose, this study was carried out at the outpatient clinics of Dermatology and Venereology Department, Faculty of Medicine, Zagazig University Hospitals in the period from December 2011 till October 2012. It was applied on forty persons ranging from 27:72 years old. They were divided into two groups. Group (1) LP patients, excluding LP like eruption and treatment for LP such as systemic

corticosteroids, retinoid acid or methotrexate. Group (2) Healthy controls with other skin diseases other than LP (mainly nevi, melasma and verruca). The two groups were evaluated according to their age, sex, BMI, lipid profile, including (TG, HDL-C, LDL-C, C). In this work there was no statistically significant difference among the studied groups as regards their gender and BMI distribution while there is a significant difference in age that was found between LP patients and controls.

This study comparing lipid profile between patients with LP and healthy control showed that there were no significant difference between patients and controls as regard serum TG, HDL-C, LDL-C and C. In contrast to these results (15) who evaluated lipid levels in men and women with LP and in healthy controls and found an association between LP and dyslipidaemia as well as (15) who evaluated lipid levels in men and women with LP and in healthy controls, excluding LP like eruption and treatment for LP such as systemic corticosteroids, retinoid acid or methotrexate and indicated an association between LP and dyslipidaemia.

While (16) found Serum C in OLP group was significantly higher than controls, but serum HDL-C and serum TG levels were decreased in OLP group when compared with a healthy control group.

However, (17) found high LDL-C /HDL-C ratio that has already been considered as a sensitive predictor of cardiovascular risk. In the present study comparing LDL-C/HDL-C Values between patients with LP and controls showed that there was no significant difference between patients and controls. In contrast to this result (6), patients with LP presented higher values of this ratio.

In this study comparing total cholesterol/HDL-C values between patients with LP and controls showed that there was no significant difference between patients and controls. In contrast to this result (18) patients with OLP presented higher values of this ratio than the control group as well as (6) found patients with LP presented higher total cholesterol/HDL-C values of this ratio than controls.

Atherogenic index of plasma (AIP) calculated as total cholesterol/ HDL-C has been used by some practitioners as a significant predictor of atherosclerosis. This study found patients with LP presented lower non significant AIP values than the control group.

In our work we found that there is no correlation between LP and dyslipidemia.

Summary and Conclusion

From our results showed that patients with LP presented lower non significant triglyceride values, higher non significant HDL-C values, lower non significant LDL-C, higher non significant total cholesterol values, lower non- significant total cholesterol/HDL-C ratio and lower non- significant LDL-C/HDL-C ratio versus controls. From our results we can conclude no association of dyslipidemia in LP patients.

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Recommendations

We recommend following up of patients with LP for the development of cardiovascular risk factors permits an earlier diagnosis of an unknown dyslipidemia and initiation of appropriate treatment. Also, we recommend more prospective studies with larger numbers of patients are required to confirm the findings and to analyze if the pathogenic mechanisms underlying the increase in cardiovascular risk in patients with LP.

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