

ORIGINAL RESEARCH

Evaluation of Serum Leptin and Lipid Profile in Lichen Planus patients

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ABSTRACT

Background: Lichen planus is a chronic inflammatory disease that affects the skin, hair follicles, nails, and mucosa. Mucosal surfaces affected include the oral, genital, ocular, otic, esophageal surfaces, and in rarer instances, the bladder, nasal, laryngeal, and anal surfaces.

Materials and methods: A prospective case-control study was conducted to investigate a potential link between lichen planus (LP), leptin levels, and blood fat profile. They recruited 40 patients with LP and 40 healthy controls ensuring participants with LP were not on recent medications and had no other health conditions that could influence the results. Data analysis was performed using SPSS.

Results: Significant alteration of lipid profile and leptin levels occur among lichen planus patients.

Conclusion: Elevated levels of leptin, known as hyperleptinemia, have been linked to lichen planus (LP) and may play a role in its development or severity.

Keywords: Inflammatory, Lipid, Leptin

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INTRODUCTION

Lichen planus is a chronic inflammatory disease that affects the skin, hair follicles, nails, and mucosa.¹ Mucosal surfaces affected include the oral, genital, ocular, otic, esophageal surfaces, and in rarer instances, the bladder, nasal, laryngeal, and anal surfaces. The skin and oral mucosa are the major sites that are affected. LP is a group of chronic inflammatory diseases affecting stratified squamous epithelia. Recently, LP is perceived as a T cell-mediated autoimmune disease, in which cytotoxic CD8+ T-cells are recruited into the skin and subsequently lead to an interface dermatitis². Viruses, drugs and contact allergens have all been reported to be possibly associated with development of LP^{3,4}. Clinically, LP is hallmarked by characteristic lesions, affecting the skin, hair, nails and/or mucous membranes. The classical skin changes are pruritic, purple, polygonal, flat-topped (planar) papules crossed by fine white lines, while erosions are seen on the mucous membranes. LP preferentially affects middle-aged adults, with no known gender predisposition⁵. Whilst the clinical features are relatively characteristic, histological confirmation of the diagnosis is recommended to exclude potential differential diagnoses. The typical band-like lymphocytic infiltrate and interface dermatitis are the characteristic findings—irrespective of skin location or disease subtype. In addition to routine histology,

direct immunofluorescence (IF) microscopy may demonstrate C3 and/or IgG at the dermal-epidermal junction and deposition of IgM as so-called colloid bodies⁶. The overall goal of treatment is symptom control and resolution of the skin lesions. Selection of treatment should be based on the severity of the disease, the extent of the subjective symptoms, as well as taking into account relevant co-morbidities⁷. Cutaneous LP is usually self-limiting and resolves within 6 months in over 50% of patients and within 18 months in up to 85% of patients⁸. Hence; the present study was conducted for evaluating serum leptin and lipid profile in lichen planus patients.

MATERIALS AND METHODS

A prospective case-control study was conducted to investigate a potential link between lichen planus (LP), leptin levels, and blood fat profile. They recruited 40 patients with LP and 40 healthy controls ensuring participants with LP were not on recent medications and had no other health conditions that could influence the results. Participants ranged in age from 18 to 65 years. Blood tests were performed to measure serum leptin level and lipid profile in both groups. The researchers recruited people with LP and healthy controls, making sure the two groups were similar in age and sex. They then measured leptin and fat levels in the blood of all participants. Blood tests were then conducted to assess routine biochemical

parameters, lipid profile (fats in the blood), and serum leptin levels. All this data was meticulously recorded for further analysis. Automated analyser was used to measure various blood fat levels (triglycerides, total cholesterol, HDL, LDL, and VLDL) with enzymatic methods. ELISA was used for evaluation of serum leptin levels.

RESULTS

80 participants were enrolled in this study, divided into two equal groups: 40 patients diagnosed with lichen planus (LP) and 40 healthy volunteers. To ensure fair comparison, the researchers carefully matched the groups by age, gender, and body mass index (BMI)(table 1).

Table 1: Demographic characteristics

Parameters	Lichen planus (n=40)	Healthy volunteers (n=40)	P value
Age in years (mean + SD)	46.43±23.66	43.50±8.52	0.421
Gender(M/F)	21/19	12/28	0.763
BMI (kg/m ²)(mean + SD)	36.27±3.26	25.07±4.12	0.161
Forms of illness	Cutaneous-27 Mucocutaneous-6 Oral-7		

Leptin levels were significantly higher in LP group compared to healthy volunteers (Table 2)

Table 2: Serum leptin level in two groups

Parameters	Lichen planus (n=40)	Healthy volunteers (n=40)	P value
Leptin (ng/ml)	31.72	21.62	0.02*

*Significant

Among lipid profile parameters TC, LDL and TG was significantly higher in LP group compared to healthy control (Table 3).

Table 3: Lipid profile in two groups

Parameters	Lichen planus (n=40)	Healthy volunteers (n=40)	P value
TC (mg/dl)	325.36	171.01	0.04*
TG (mg/dl)	160.33	122.73	0.00*
LDL (mg/dl)	155.51	92.64	0.02
HDL (mg/dl)	51.01	51.28	0.61
VLDL(mg/dl)	44.81	43.32	0.59

*: Significant

In mucocutaneous form of LP, leptin was found to be significantly higher compared to other forms, such as cutaneous and oral LP (OLP)[table 4]

Table 4: Leptin level in different forms of Lichen planus

Parameters	Mucocutaneous LP	Cutaneous LP	Oral LP	P value
Leptin(ng/ml) (Mean+SD)(CI)	37.82+12.81 (32.41- 43.35)	33.51+20.17 (10.22- 27.67)	8.41+3.52 (6.39- 6.52)	0.031*

*: Significant

DISCUSSION

This study investigated potential connections between a skin condition called lichen planus (LP) and two aspects of blood chemistry: leptin levels and lipid profile. The study focused on patients newly diagnosed with LP and compared their blood levels of these substances to healthy volunteers. Our study revealed significantly higher leptin levels in the lichen planus (LP) group compared to healthy controls. This is intriguing because LP is an autoimmune disease, where the body's immune system attacks healthy tissue. One theory suggests LP involves cytotoxic CD8+ T-cells attacking the skin, potentially triggered by viruses, drugs, or allergens^{10,11}. In the present study, significant alteration of lipid profile and leptin levels occur among lichen planus patients. Mehdi pour M et al explored the potential of lipid rafts as targets for the development of a new

class of agents to down-modulate immune responses and treat autoimmune diseases. A total of 3 mL of blood sample was taken from each subject and the serum levels of cholesterol, triglycerides, HDL and LDL were determined. The mean outcomes of each group were compared with each other and analyzed two by two. The results of statistical analyses showed no significant differences in mean HDL and LDL serum levels between the three groups. The results of post hoc LSD test showed that mean serum levels of subjects with erosive and non-erosive lichen planus were higher than those in healthy subjects. In relation to triglyceride serum levels, the mean serum levels of triglycerides were higher in erosive and non-erosive OLP patients compared to healthy subjects. Triglyceride and cholesterol can be considered to have a critical role in the incidence of lichen planus and in its manifestations as predisposing factors.¹² Idris S et

al evaluated the association of skin tags with BMI, serum leptin and lipid profile. The study was carried out in 40 cases with ST and 40 age and gender matched controls. Subjects on oral contraceptives and systemic drugs especially lipid lowering agents, pregnant women, cases with medical history of endocrine disease, acute infection, erythroderma and psoriasis, cases with a drug history of isotretinoin use in last six months were excluded from the study. Blood samples were collected. Serum lipids and serum leptin were estimated. The acrochordons group showed significantly higher values of BMI, total cholesterol (TC) and TC/HDL ratio. 60% of the patients with ST were overweight and 10% were obese. There was no statistical significant difference in leptin levels between the groups. Leptin showed a positive significant correlation with BMI in the acrochordons group. All the above derangements confirm that ST is cutaneous findings frequently associated with obesity and dyslipidemia.¹³

CONCLUSION

Elevated levels of leptin, known as hyperleptinemia, have been linked to lichen planus (LP) and may play a role in its development or severity.

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