ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

A Study Of Association Of Parameters Of Metabolic Syndrome In Patients Of Lichen Planus.

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ABSTRACT

Lichen planus (LP) is a chronic inflammatory disease affecting the skin, mucous membranes, and appendages. Emerging evidence suggests a potential association between LP and metabolic syndrome (MetS), a cluster of metabolic abnormalities that significantly increase the risk of cardiovascular disease and diabetes mellitus. Our aim to study the association of metabolic syndrome parameters in patients diagnosed with LP. This cross-sectional observational study was conducted on 311 patients (142 males and 169 females) with LP in the Department of Dermatology, LG Hospital, from August 2019 to September 2021. Patients were evaluated for MetS using modified NCEP-ATP III criteria. Data analysis was performed using SPSS 15.0, with significance set at $p \leq 0.05$. MetS was observed in 18% of LP patients, with a higher prevalence in oral LP (50%) compared to cutaneous LP (32.1%). Hypertension (42.8%), elevated fasting glucose (54.9%), and hypertriglyceridemia (31.5%) were common metabolic abnormalities. Females exhibited higher rates of central obesity (30.5%) and decreased HDL-cholesterol (28.9%). Our study demonstrates a significant association between LP and MetS, highlighting the importance of metabolic screening in LP patients to identify and manage underlying risks early.
Keywords: Lichen Planus, Metabolic Syndrome, Inflammation

https://doi.org/10.33887/rjpbcs/2025.16.1.27

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ISSN: 0975-8585

INTRODUCTION

Lichen planus (LP) is a chronic inflammatory disease affecting the skin, mucous membranes, hair, and nails [1]. The etiology of LP remains uncertain, but it is widely recognized as an immune-mediated disorder with potential triggers such as infections, stress, or drug reactions. Metabolic syndrome (MetS), on the other hand, is a cluster of interrelated metabolic abnormalities, including central obesity, hypertension, hyperglycemia, and dyslipidemia, that significantly increase the risk of cardiovascular disease and diabetes mellitus [2, 3].

Recent studies suggest a potential association between LP and MetS, hypothesizing that chronic systemic inflammation may serve as a common link. Patients with LP have been observed to exhibit a higher prevalence of metabolic abnormalities, suggesting that LP may not only be a cutaneous condition but also a marker of underlying metabolic disturbances. Pro-inflammatory cytokines and oxidative stress in MetS could exacerbate immune dysregulation in LP, forming a bidirectional relationship [3-5].

Our study aims to investigate the association between various parameters of MetS and LP, thereby providing insights into the interplay of these conditions. Identifying such links can facilitate early screening for metabolic complications in LP patients and guide therapeutic strategies to manage both the cutaneous and systemic aspects effectively.

STUDY METHODOLOGY

A cross-sectional observational study was conducted in the Department of Dermatology at LG Hospital from August 2019 to September 2021, following approval from the Institutional Review Board. A total of 311 patients, comprising 142 males and 169 females, were included in the study. Subjects aged between 18 and 60 years and clinically diagnosed with lichen planus (LP) affecting the skin, mucous membrane, or appendages were considered eligible. Written informed consent was obtained from all participants before their enrollment. Patients with a history of metabolic derangements prior to the development of LP lesions, a family history of cardiovascular disease, systemic treatment for LP in the preceding month, or who were pregnant or lactating were excluded.

Participants were recruited from the dermatology outpatient department. Those who satisfied the inclusion criteria underwent a detailed clinical history assessment and physical examination. Clinical data and necessary parameters were documented in a predefined proforma. Photographs of the lesions were taken under adequate daylight for accurate documentation. The diagnosis of lichen planus was established based on clinical findings, including the presence of itchy, violaceous, flat-topped, polygonal papules, and plaques.

Statistical analyses were performed using SPSS version 15.0 for Windows. Qualitative variables were analyzed using Pearson's correlation test, while associations among variables were examined with Pearson's coefficient. Multivariate analysis was conducted to estimate adjusted odds ratios (ORs) with 95% confidence intervals (CIs) to evaluate the association between LP and parameters of metabolic syndrome.

Statistical significance was set at $P \leq 0.05$ for all analyses. Conditional logistic regression was employed to calculate ORs and CIs. The results were interpreted to determine the strength of association between LP and metabolic syndrome parameters, thereby facilitating an understanding of potential metabolic risks in patients with lichen planus.

RESULTS

Table 1: Gender Distribution of Patients

Gender	Number of Patients	Percentage (%)
Male	142	45.6
Female	169	54.3
Total	**311**	**100**

ISSN: 0975-8585

Table 2: Types of Lichen Planus (LP)

Type of LP	Number of Patients	Percentage (%)
Cutaneous LP (CLP)	144	46.3
Oral LP	111	35.7
Both Skin and Oral LP	53	17.0
Genital LP	3	0.96
Total	**311**	**100**

Table 3: Morphology of Cutaneous LP (CLP)

Morphological Type	Number of Patients
Hypertrophic	84
Guttate	27
LP Pigmentosus	12
Linear	11
LP Pilaris	8
Annular	4

Table 4: Metabolic Syndrome Parameters in LP Patients

Parameter	Number of Patients	Percentage (%)
Elevated Waist Circumference	137	44.1
Hypertension (HT)	133	42.8
Hypertriglyceridemia	98	31.5
Decreased HDL-Cholesterol	90 (Female), 48 (Male)	28.9 (Female), 15.4 (Male)
Elevated Fasting Blood Glucose	171	54.9

Among the patients with lichen planus (LP), metabolic syndrome parameters were notably prevalent. Elevated waist circumference, a marker of central obesity, was observed in 44.1% of the patients, while hypertension was present in 42.8%. Hypertriglyceridemia was identified in 31.5% of the cases, and decreased HDL-cholesterol levels were recorded in 28.9% of females and 15.4% of males. Elevated fasting blood glucose was the most common abnormality, affecting 54.9% of the patients. These findings underscore the significant overlap between LP and metabolic syndrome, highlighting the need for metabolic evaluation in LP patients.

DISCUSSION

Lichen planus (LP), an immune-mediated inflammatory condition, has been linked to systemic comorbidities, particularly metabolic syndrome (MetS). MetS, characterized by a constellation of metabolic abnormalities including central obesity, dyslipidemia, hypertension, and impaired glucose metabolism, significantly increases cardiovascular and diabetic risks. This study explored the association between LP and various parameters of MetS, providing valuable insights into their interrelationship [7-9].

Gender Distribution and Demographics

In our study of 311 patients, females (54.3%) outnumbered males (45.6%), reflecting a slight female preponderance in LP cases, consistent with previous research. Studies by Santiago et al. and Baykal et al. also observed higher LP prevalence in females, which may be attributed to hormonal or immunological differences influencing disease susceptibility. The mean age of the patients was 39.58 years, aligning with the typical presentation of LP in the fourth to sixth decades of life. These demographic trends emphasize the need for targeted awareness and screening in middle-aged individuals, particularly women [10].

Types and Morphology of Lichen Planus

Cutaneous LP (CLP) was the most prevalent type, observed in 46.3% of patients, followed by oral LP (35.7%), while 17% had both skin and oral involvement. Genital LP was rare (0.96%), underscoring its

uncommon occurrence in clinical practice. Among CLP cases, the most common morphological subtype was hypertrophic LP (58.3%), characterized by hyperkeratotic lesions that tend to persist and cause significant morbidity. Other subtypes included guttate (18.8%), LP pigmentosus (8.3%), linear (7.6%), and LP pilaris (5.6%). These findings align with earlier studies, highlighting hypertrophic LP as a dominant subtype, possibly due to chronicity and prolonged inflammatory activity [11].

Oral LP was predominantly erosive (51.35%), followed by reticulate (48.64%), and plaque forms (1.8%). The high prevalence of erosive oral LP underscores its clinical significance, as it often presents with pain and functional impairment, affecting the quality of life. These results corroborate studies by Tickoo et al. and Anbar et al., emphasizing the predominance of erosive and hypertrophic subtypes across different populations [12].

Metabolic Syndrome in Lichen Planus

MetS was observed in 18% of patients, with the highest prevalence in those aged 45–60 years. This aligns with the understanding that MetS incidence increases with age, reflecting cumulative exposure to risk factors such as sedentary lifestyle and obesity. Among patients with oral LP, 50% exhibited MetS, compared to 32.1% with CLP and 17.8% with combined skin and oral involvement. The higher prevalence of MetS in oral LP could be attributed to the persistent inflammatory state, promoting systemic metabolic dysregulation.

Parameters of Metabolic Syndrome

In this study, hypertension was present in 42.8% of patients, elevated fasting blood glucose in 54.9%, hypertriglyceridemia in 31.5%, and decreased HDL-cholesterol in 28.9% of females and 15.4% of males. Elevated waist circumference, a key marker of central obesity, was noted in 44.1% of patients, significantly more in females (30.5%) than males (14.1%). These findings are consistent with previous studies, such as those by Arias-Santiago et al., highlighting the association between LP and MetS components.

The significant prevalence of metabolic abnormalities in LP patients suggests that chronic systemic inflammation might play a pivotal role. Inflammatory cytokines such as TNF-α, IL-6, and IL-1β, implicated in LP pathogenesis, can impair glucose metabolism, promote endothelial dysfunction, and alter lipid profiles. This bidirectional relationship highlights the need to consider LP as a potential marker for underlying metabolic dysfunction.

Our findings align with studies by Lopez-Jornet et al., which demonstrated higher triglyceride levels and reduced HDL-cholesterol in patients with erosive oral LP. Similarly, Arias-Santiago et al. reported a significant association between LP and MetS components, particularly hypertriglyceridemia and low HDL levels. The mean BMI of LP patients in our study was 24.3 kg/m^2, with 52.7% being overweight or obese. This echoes findings by Kar et al., who reported similar BMI trends in LP patients, further strengthening the link between LP and obesity-related metabolic abnormalities [7, 8].

The association of LP with MetS underscores the importance of routine screening for metabolic abnormalities in LP patients. Early identification of hypertension, dyslipidemia, and hyperglycemia can help mitigate the long-term risks of cardiovascular disease and diabetes. Additionally, recognizing the higher prevalence of MetS in oral LP and hypertrophic CLP subtypes may guide clinicians in prioritizing these patients for metabolic evaluation.

CONCLUSION

Our study highlights a significant association between LP and MetS, particularly in middle-aged females and patients with oral or hypertrophic LP. The findings reinforce the role of chronic systemic inflammation in bridging these conditions. Incorporating metabolic screening into the management of LP patients can enable early detection of metabolic risks and improve overall health outcomes. Further research is warranted to explore the underlying mechanisms and develop targeted therapeutic strategies addressing both LP and metabolic dysregulation.

ISSN: 0975-8585

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