Section: DVL

Original Research Article

CASE CONTROL STUDY ON METABOLIC DERANGEMENTS IN LICHEN PLANUS

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Abstract

Background: Lichen Planus (LP) is a subacute or chronic inflammatory, autoimmune and papulosquamous disorder affecting the skin, oral mucosa, genital mucosa, scalp, and nails. Although the etiology and pathogenesis are not fully understood, it is thought that Lichen Planus represents a T cell-mediated inflammatory disorder. **Objectives:** To describe the various morphological types of Lichen Planus and to estimate the metabolic derangements in Lichen Planus. **Material & Methods:** It was a Case-control study conducted at rural tertiary care hospital for 18 months from January 2020 to June 2021 conducted in Patients attending the Department of DVL. Purposive sampling method was used. Sample size was calculated based on the Mysore study conducted by Singla R,[1] et al, where the dyslipidemia was reported as 65% among cases. However, it was considered to take '120' cases and '120' controls in 1:1 ratio. So, the total sample size for this study will be '240'. The data was entered into MS excel 2007 version and further analyzed using SPSS version 21. Descriptive statistics was done for categorical data and was analyzed using percentages and the continuous data was analysed using mean and standard deviation. **Results:** Classical LP was commonest type of LP 70 (58.33%), followed by other types like Oral LP 16(13.33%), Hyper tropic LP 15(12.5%), Eruptive 10(8.33%), LPP 3(2.5%), Linear LP 3(2.5%), Follicular LP 2(1.67%), Atrophic LP 1(0.84%) in descending order of prevalence. Statistically significant (p value < 0.05) findings were found in parameters like Waist circumference in females, Diastolic Blood pressure, Fasting Blood sugars, Fasting High Density Lipoproteins in males, Triglycerides levels and Metabolic syndrome association. **Conclusion:** In patients with LP, chronic inflammation could explain its association with metabolic syndrome and its other components. Screening of such patients for metabolic syndrome will be useful in detecting at-risk individuals and initiating measures of prevention to protect against the development of cardiovascular disorders later in life.

INTRODUCTION

Lichen Planus (LP) is a subacute or chronic inflammatory, autoimmune and papulosquamous disorder affecting the skin, oral mucosa, genital mucosa, scalp, and nails.[1] Although the etiology and pathogenesis are not fully understood, it is thought that Lichen Planus represents a T cell-mediated inflammatory disorder.[2] Inflammation produces disturbances in lipid metabolism such as increased serum triglycerides, Low-density lipoprotein cholesterol, and decreased High-density lipoprotein, which were linked to chronic inflammation participate in the increased risk of cardiovascular disease associated with dyslipidemia.

The abnormal enzymatic activity has been shown by epidermal cells in Lichen Planus along with defective carbohydrate expression.[3] Increased prevalence of diabetes and carbohydrate intolerance was observed in Lichen Planus patients, suggesting its role in the pathogenesis. Chronic inflammation along with elevated levels of proinflammatory cytokines is the hallmark of Metabolic Syndrome. Adipocytokines (such as Leptin, adiponectin, tumor necrosis factor-α (TNF), interleukin 6 (IL-6), monocyte chemotactic protein-1(MCP-1)) which play a major role in the pathogenesis of insulin resistance and metabolic complications such as dyslipidemia, hypertension, and premature heart disease. The levels of these

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adipocytokines are elevated in many dermatological diseases.[4]

In developing countries like India, data related to lipid parameters are not widely available in patients with Lichen planus.[5] So, in this study metabolic derangements are studied in patients with Lichen planus in comparison with controls.

MATERIALS AND METHODS

It was a Case-control study conducted at rural tertiary care hospital for 18 months from January 2020 to June 2021 conducted in Patients attending the Department of DVL. Purposive sampling method was used. Based on the Mysore study conducted by Singla R,[1] et al, where the dyslipidemia was reported as 65% among cases, by using the formula

n= (Z (1-α/2)) 2 x p (100-p)/d2

Where d=9, Number of cases for the study=110, However, it was considered to take '120' cases and '120' in 1:1 ratio. So, the total sample size for this study will be '240'.

Inclusion Criteria

Cases: Lichen Planus (both skin and/or mucosa) patients of age 18 years and above of both genders will be included.

Controls

1. Age and gender-matched patients with other non-inflammatory skin diseases attending the DVL OPD of the hospital.

Exclusion Criteria

Cases

1. Family history of cardiovascular diseases.
2. Patients who are already on systemic treatments will be excluded.

Controls

1. With a chronic inflammatory condition like psoriasis.
2. Family history of cardiovascular diseases, patients who are already on systemic treatments will be excluded.

Study Tool

Anthropometric data like height, weight, waist circumference and

BMI [Body Mass Index(kg/m2)] are noted. Manual Blood pressure measurement with a mercury sphygmomanometer in the supine position after lying for 5 minutes. Venous blood samples after an overnight fast of at least 8 hours for fasting blood sugar and serum fasting lipid profile estimation were taken. Histopathological examination of skin biopsy was done in cases when the diagnosis is doubtful and to confirm.

Methodology

A pre-structural questionnaire was given and data was collected after obtaining informed/written consent from the patient. A detailed history of onset, duration of the disease, evolution of lesions, family history, drug intake, associated skin, and systemic complaints was noted. The patients were examined thoroughly and the necessary examinations and investigations were done to analyse the metabolic derangements in both cases and controls.

Statistical Analysis

The data was entered into MS excel 2007 version and further analyzed using SPSS version 21. Descriptive statistics was done for categorical data and was analyzed using percentages and the continuous data was analysed using mean and standard deviation. Inferential statistics was analysed as follows: Chi-square test,'t-test, etc, was used. A probability value of < 0.05 will be considered as significant.

RESULTS

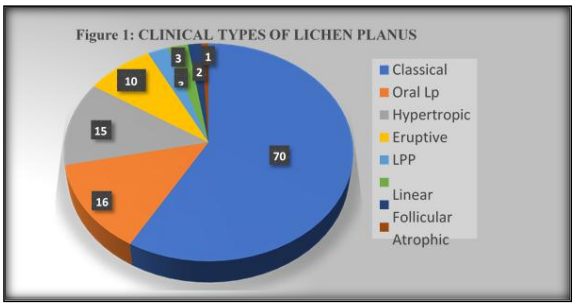

Figure 1: Clinical Types of Lichen planus

As per figure 1 Classical LP was commonest type of LP 70 (58.33%), followed by other types like Oral LP 16(13.33%), Hyper tropic LP 15(12.5%), Eruptive 10(8.33%), LPP 3(2.5%), Linear LP 3(2.5%), Follicular LP 2(1.67%), Atrophic LP 1(0.84%) in descending order of prevalence. Among classical LP patients, 5 had oral involvement also, 1 male patient had genital involvement. Out of 120 cases of LP Male cases are 63 (52%), Female cases are 57(48%). Males are more affected than females among LP cases. Among Male patients, the mean age is 44 years and among Females, it is 46 years. Among 120 Cases of LP, 36 (30%) patients are in the age group of 39 to 48 years, 30 (25%) patients are in the age group of 49 to 58 years, 21 (17.5%) patients are in the age group of 29 to 38 years,14 (11.6%) patients are in the age group of 59 to 68 years, 13 (10.9%) patients are in the age group of 18 to 28 years, 6 (5%) patients are in the age > 69 years.

Among the Cases group, no one is under mild thinness,19(15.8%) are in the normal range, 34(28.3%) were overweight, 54(45%) are in obese I, only 13(10.8%) are in Obese II. Among Controls group only 1(0.8%) is in mild thinness, 49(40.8%) are normal, 43(35.8%) are in over-weight, 21(17.5%) in obese I, only 6(5%) are in Obese II. Among cases, BMI > 25 kg/ m2 were 101(59%), whereas in controls there are 70(41%). Among Cases 4 are in (141 – 150 cm), 87 are in (151 -160 cm), 29 are in (161 – 170 cm), no cases above 170 cm. Among Controls 6 are in (141 – 150 cm), 44 are in (151 – 160 cm), 62 are in (161 – 170 cm), 8 are in (>170 cm). Among Cases 63 (52.5%) patients are in the range of 61 -80 kg, 42 (35%) are in 81 to 100 kg, 13 (10.83%) patients in 41 to 60 kg, 2 (1.6%) patients in > 100 kg. Among Controls 70 (58.3%) patients are in the range

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of 61 -80 kg, 30 (25%) are in 41 to 60 kgs, 20 (16.6%) patients in 81 to 100 kg, no patients in > 100 kg [Table 1].

As per table 2 statistically significant (p value < 0.05) findings were found in parameters like Waist circumference in females, Diastolic Blood pressure, Fasting Blood sugars, Fasting High Density Lipoproteins in males, Triglycerides levels and Metabolic syndrome association [Table 2].

As per table 2 the independent factors are diastolic blood pressure, Triglycerides, fasting blood glucose, HDL, waist circumference (female), metabolic syndrome found to be statistically significant [Table 3].

Table 1: BMI (Kg/m2) Distribution Among Cases and Control Groups

BMI (kg/m^2)	Cases (%)	Controls (%)	Total
17-18.5(mild thinness)	0 (0)	1(0.8)	1
18.5-25 (Normal)	19 (15.8)	49 (40.8)	68
25-30 (Over weight)	34 (28.3)	43 (35.8)	77
30-35 (Obese I)	54 (45)	21 (17.5)	75
35-40 (Obese II)	13 (10.8)	6 (5)	19
Total	120 (100)	120 (100)	240

Table 2: Clinical and Laboratory Parameters in Cases and Controls

Characteristics	Cases (%)	Controls (%)	p-Value
W. C in males > 102 (cm)	14 (22.2)	7 (11.1)	0.094
W. C in females > 88 (cm)	28 (49.1)	8 (14)	<0.001**
Systolic BP > 130 (mm Hg)	49 (40.8)	37 (30.8)	0.106
Diastolic BP > 85 (mm Hg)	56 (46.6)	19 15.8)	<0.001**
FBS (> 110 mg/dL)	26 (21.6)	2 (1.6)	<0.001**
HDL (< 50mg/dL) females	55 (96.4)	56 (98.2)	0.558
HDL (< 40mg/dL) males	38 (60.3)	17 (26.9)	<0.001**
Triglycerides > 150 (mg/dL)	47 (39.1)	7 (5.8)	<0.001**
Metabolic syndrome	52 (43.3)	10 (8.3)	<0.001**

Table 3: Binary logistic regression model for lichen planus cases

Characteristics	ODDS Ratio	C.I	C.I	P Value
Systolic BP	1.0	0.98	1.0	0.106
Diastolic BP	1.1	1.05	1.16	<0.001**
TGL (mg/dL)	0.99	0.98	1.0	<0.001**
FBS (mg/dL)	1.03	1.00	1.06	<0.001**
HDL (mg/dL) Female	0.98	0.94	1.02	0.558
HDL (mg/dL) Male	4.1	1.94	8.71	<0.001**
WC (cm) Male	1.75	0.6	5.5	0.2617
WC (cm) Female	5.91	2.38	14.69	<0.001**
Metabolic syndrome	8.41	3.8	19.6	<0.001*

DISCUSSION

Lichen planus (LP) is a chronic, auto-immune papulo squamous disorder involving the skin, mucous membrane, nail, and hair follicle[6]. Th1 cytokines IL – 2, 4, 6, 10, and TNF – alfa in the pathogenesis of Lichen Planus play a causal role in risk factors of metabolic syndrome including central obesity, dyslipidemia, hypertension, and insulin resistance which are the strongest risk factor predictors for diabetes, stroke and cardiovascular diseases.[7]

This is a Case-control study where 120 cases of Lichen Planus were compared with 120 age and gender-matched controls of other dermatological diseases presented to the department of Dermatology in PES Institute of Medical sciences and research from January 2020 to June 2021. Detailed history and clinical examination were done.

In this study, the majority of the Lichen planus cases were belonging to the fifth decade of life, which is consistent with the study by Geetharani G3, whereas, in another study by Omal et al,[8] the majority of the patients were belonging to third and sixth decade. But a study by Prasad et al,[9] in the seventh decade showed the prevalence of Lichen planus.

In this study slight male preponderance was noted, whereas, in the study by Geetha rani G,[10] et.al., female preponderance was noted in all age groups.

A study by Parihar et.al,[11] showed more female preponderance which is not consistent with the present study. In patients with generalized Lichen planus had less intense itching than with localized variants like Hypertrophic lichen planus, where the intensity of itching over the hypertrophic plaques was severe. Only eleven (9.1%) patients did not have itching in the study by N Srivani et al,[16], which was almost double the number of patients without itching in the present study.

According to the study by Kumar S.A et al,[3] mean duration of disease was less than 2 years in (78.67%), whereas disease duration of more than 2 years in (21.33%) with a disease duration of 18.23 months (SD = 1.61 years). The commonest type of Lichen Planus (58.33%), this finding was consistent with other studies which were conducted by Parihar et al[11]., Geetha rani G,[10] et al., followed by other

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types like Oral Lichen Planus (13.33%), Hyper trophic Lichen Planus (12.5%), Eruptive Lichen planus (8.33%), Lichen Plano Pilaris (2.5%), Linear Lichen Planus (2.5%), Follicular Lichen Planus (1.67%), Atrophic Lichen Planus (0.84%) in descending order of prevalence.

Among the one hundred and twenty Lichen planus cases in this study, seventeen (14.1%) patients had mucosal Lichen planus involvement. Sixteen patients (13.3%) among them were having oral mucosal involvement and only one (0.8%) male patient had genital lesions. This finding in the present study was consistent with the study by Shen et al.[12] A study by Daye et al,[13] among 48% of cases metabolic syndrome association was found in lichen planus group and it was significantly higher than the control group.

In this study, the prevalence of metabolic syndrome was statistically significant in LP cases and it was found to be 43% and in controls it was 8%. In a study by Daye et al,[13] metabolic syndrome association was found in 48% of LP cases. In a study by Kurian et al,[14] out of 40 patients with Lichen planus 18 (45%) patients had metabolic syndrome when compared to 32 (40%) individuals without LP with a p-value of 0.292. study by Kuntoji v et al,[15] where the criteria for metabolic syndrome according to ATP III criteria was fulfilled by only 6% of the cases, and was not statistically significant.

According to the study by SA Kumar,[3] Metabolic syndrome was diagnosed as per NCEP ATP III criteria, with 34.67% among cases group and in controls group it was about 14% which was also insignificant statistically with p – value of 0.656.

CONCLUSION

In patients with LP, chronic inflammation could explain its association with metabolic syndrome and its other components. Screening of such patients for metabolic syndrome will be useful in detecting at-risk individuals and initiating measures of prevention to protect against the development of cardiovascular disorders later in life. Obesity is the major inducer of dyslipidemia, which is the major component of metabolic syndrome. Life style modification is must.

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