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Dermatology

Prevalence of Dyslipidaemia in Lichen Planus in a Tertiary Level Hospital

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Abstract **Original Research Article**

Background: Lichen planus (LP) is a chronic inflammatory papulosquamous disorder affecting the skin, mucous membranes, hair, and nails. It is clinically characterized by small, flat-topped, shiny, polygonal violaceous papules that may coalesce into plaques. It is believed that LP represents a T-cell-mediated inflammatory disorder. Chronic inflammation causes disturbances in the lipid metabolism. A link between dermatological disorders and dyslipidemia has been established in the recent past. When this dyslipidemia becomes prolonged it increases the risk of cardiovascular disease, stroke & metabolic syndrome. Proper evaluation & early detection reduced the burden of dyslipidaemia in patients with Lichen planus. ***Objectives:*** Purpose of this study was to evaluate the prevalence of dyslipidaemia in patient with lichen planus. ***Materials & Method:*** This cross-sectional study was conducted Department of Dermatology and Venereology, Dhaka Medical College Hospital, Dhaka. Total sample size was 100. Patients with lichen planus aged >18 years of age and of both sexes were enrolled for study. Clinical examination and relevant investigation were done meticulously. Serum lipid profile was evaluated based on NCEP/ATP III criteria. Data was processed and analysed with the help of computer program SPSS and Microsoft excel. Quantitative data expressed as mean and standard deviation and qualitative data as frequency and percentage. Comparison was done by tabulation and graphical presentation in the form of tables, pie chart, graphs, bar diagrams, histogram & charts etc. ***Results:*** in this study maximum incidence was seen in the 4th decade (e.g., 57.0%), mean age of the patient was 53.42±8.5 years. Male and female ratio was 4.88:1. On evaluation of serum lipid level, 28 patients found borderline to high total cholesterol level (> 200 mg/dl) with mean value 167.57 mg/dl ± 47.84. Abnormal Serum LDL cholesterol was detected in 32 patients with mean value 126.16 mg/dl ± 47.29. Serum HDL cholesterol was significant in 23 patients, mean value 45.27 mg/dl ± 8.54. Serum triglyceride (TG) level was significantly raised in lichen panus patients. Table shows 39.0% have elevated range of triglyceride (TG) and mean level was 157.25 mg/dl ± 100.16. Among 100 patients, 39.0% cases had dyslipidemia- in a single or multiple patterns. ***Conclusion:*** Present study concluded that abnormal lipid metabolism is common in patient with lichen planus. Presence of such abnormal metabolism may justify routine screening of these disorders for associated dyslipidemia and other metabolic abnormalities and early treatment of such comorbidities to improve quality of life. Dietary counseling may help in the control of the primary disorder and enable them to reduce the cardiovascular and metabolic risks.

Keywords: Dyslipidaemia, Lichen Planus (LP), Serum triglyceride, dermatological disorders.

INTRODUCTION

Lichen planus (LP) is a chronic inflammatory and immune mediated disease that affects the skin, nails, hair, and mucous membranes. Cutaneous lichen planus (CLP) most commonly involves the flexor surfaces of the extremities and presents as small itchy violaceous Papules in middle-aged adult [1]. The major burdens of lichen planus are itching and residual hyperpigmentation in the cutaneous form and pain and difficulties with eating in the oral erosive form. With the exception of the cutaneous form, which generally heals within 1 year, lichen planus is a chronic condition [2]. Etiology and pathogenesis revealed that LP is a T-cell-mediated autoimmune disease. Chronic inflammation nature of disease causes disturbances in the lipid metabolism. When this dyslipidemia becomes prolonged it increases the risk of cardiovascular disease [3].

Clinically LP lasts for 1 to 2 years, but may take a chronic, relapsing course over many years [4]. Study has confirmed that there is a strong connection between the imbalanced concentrations of one or more serum lipids (cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides) and the occurrence of LP which is important in the therapeutic approach to patients with this disease [5]. Numerous mechanisms are speculated to explain the link between inflammation and dyslipidemia: Modulation of the enzymatic activity of lipoprotein lipase (LPL) by anti-LPL antibodies and decrease in LPL activity due to various pro-inflammatory cytokines such as tumor necrosis factor (TNF)-α, interleukin (IL)-1, IL-6, interferon-γ, and monocyte chemoattractant protein-1. Furthermore, atherogenic complexes of autoantibodies to oxidized LDL and to oxidized anticardiolipin are generated in response to an oxidative inflammatory effect which enhances the accumulation of LDL in the endothelial wall [6, 7]. Dyslipidemias manifested by elevation of the serum total cholesterol, low-density lipoprotein (LDL) cholesterol, and triglyceride concentrations, and a decrease in the high-density lipoprotein (HDL) cholesterol concentration [8]. Dyslipidemia is global burden, studies from India have shown upward trend in the prevalence of dyslipidemia, even among the young adult population [9]. Chronic inflammatory dermatological disorders could also have other metabolic imbalances that may contribute to dyslipidemia [6].

Association of lichen planus with dyslipidemia has been reported [10-12]. Chronic inflammation in patients with lichen planus may explain the association with dyslipidemia. Studies have reported that the individuals with lichen planus have significantly higher levels of various lipids compared to controls [11]. Lipid levels screening in men or women with lichen planus may be useful to detect individuals at risk and to start preventive treatment against the development of cardiovascular disease [12].

In a case-control study reported significantly higher levels of triglycerides, total cholesterol, VLDL and significantly lower levels of HDL detected. Multivariate logistic regression model demonstrated that LP was associated with dyslipidemia, even after controlling for confounders, including age, gender, BMI [13]. This dyslipidemia if prolonged enhances the formation of atherosclerotic plaques and thereby augments the risk of cardiovascular disease in such patients.

The clinical presentation of lichen planus varies depending on the area involved. Cutaneous lichen planus is characterized by flattopped, violaceous papules, the appearance of which may cause embarrassment [14] and which in some cases can be intensely itchy. The diagnosis of lichen planus (LP) & its associated complications should be done by clinical, laboratory and histological examination. The clinical presentations of this pathology vary widely and may, in some cases, have a silent onset and be overlooked in the examination [15]. The essential principles of management of dyslipidemia involves, treating secondary or associated causes like diabetes, stopping the incriminating medication (consider alternate medication) or dosage reduction if feasible. Irrespective of the underlying dermatological disorder, cessation of cigarette smoking, and reduction of other modifiable risk factors are essential aspects of prevention of coronary heart disease [6, 8]. Aim of the study was to observe pattern of lipid profile in LP patients and evaluates its pattern and frequency.

METHODOLOGY

This is a cross sectional, observational study conducted in Dermatology and Venereology department, Dhaka Medical college Hospital. Patients with lichen planus, age >18 years&both sexes were enrolled. Sample was selected by purposive sampling technique. Diagnosis was made on the basis of patient's statement, statement of the witness, features of disease, clinical examination and available records. After fulfilling the inclusion and exclusion criteria, patient were enrolled with unique ID. Subjects were briefed about the objectives of the study, risk and benefits, freedom for participating in the study and confidentiality. Informed consent was obtained accordingly. Ten ml venous blood was collected for routine haematological test and estimation of serum lipid profile. The lipid profile of the study sample was analysed according to the ATP III classification for identification of dyslipidaemia. Lipid profiles (Total cholesterol, low density lipoprotein, high density lipoprotein, and triglycerides) were measured by direct methods with an automated biochemical analyzer using commercially available diagnostic kit. Dyslipidaemia was considered when lipid profile shows a, total cholesterol level of≥200mg/dl; HDL-C level is<40mg/dl, LDL level is≥100mg/dl& triglyceride level ≥150mg/dl. The prestructured Case Record Form (CRF) filled up by the study physician herself. The case definition of operational variable has been described. Patient data such as age, sex, clinical presentation, Co-morbid was noted. Investigations such as CBC with Serum lipid profile were arranged according to clinical presentation of the patient. Researcher visits the patient every alternate day and investigations was repeated or may be sent to outside laboratories according to clinical requirement. All the collected data questionnaire were checked very carefully to identify errors in collecting data. Data processing work consisted of registration of schedules, editing, coding and computerization, preparation of dummy tables, analysis and matching data.

Statistical analysis of the data was done using the Statistical Package for the Social Sciences for

Windows (SPSS Inc., Chicago) software version 22. Qualitative data such as sex, ASA physical status, and adverse effects was compared using Chi-square test. Quantitative data such as age, numeric rating scales, time to first analgesic request and total analgesic requirement in 24 h will be compared using independent t-test. $P < 0.05$ will be taken as statistically significant. All collected questionnaire checked very carefully to identify the error in the data. Data processing work consist of registration schedules, editing computerization, preparation of dummy table, analyzing and matching of data.

RESULTS

Maximum incidence was seen in the 4th decade 57.0%, next to it was the 5th decade 26.0%. Out of 100 cases (83%) cases were male and (17%) were female. Male and female ratio was 4.88:1. Highest incidence of male and female patients was in age group between 31-50 years, 57.83% and 52.94% respectively. Mean age of the patient was 53.42 ± 8.5 years (Table I). Table II showed area of residence of the patients. Large numbers of respondents came from urban area 73.0%, followed by rural area 27.0%. Socioeconomically poor class (42.0%) comprising the major percentage of the patients (Figure1).

There were 28 patients with borderline to high total cholesterol level (> 200 mg/dl). The mean value of total cholesterol level was 167.57 mg/dl ± 47.84. There were 68 patients with LDL cholesterol level within normal range or <100 mg/dl (optimal) level. Abnormal Serum LDL cholesterol was detected in total 32 patients. More than 190 mg/dl (very high level) was in 2 patients, level 160-189 mg/dl (high) was in 5 patients, 15 patients with LDL cholesterol level was between 101-129 mg/dl. The mean LDL cholesterol level was 126.16 mg/dl ± 47.29. Serum HDL cholesterol was significant in 23 patients. The mean HDL cholesterol level was 45.27 mg/dl ± 8.54. Serum triglyceride (TG) level was significantly raised in lichen planus patients. Table shows 39.0% have elevated range of triglyceride (TG). 61.0% cases had normal level of TG and mean triglycerides level was157.25 mg/dl ± 100.16.

Prevalence of dyslipidemia is 39% in patients with Lichen Planus (Figure 2). There were 28 patients with high total cholesterol level, 32 patients with high LDL cholesterol level, 23 patients with low HDL cholesterol level and 39 patients with high triglyceride level. The prevalence of dyslipidaemia among patients with LP in this study was high with male gender than female individual.

Table 1: Demographic characteristics of the patients (n=100)

Age (years)	Frequency		Total
	Male (n= 83)	***female (n= 17)***	
16-30	9(10.84%)	0	9
31-50	48(57.83%)	9(52.94%)	57
51-70	19(22.89%)	7(41.17%)	26
>70	7(8.43%)	1(5.88%)	8
Mean ± SD	53.42 ± 8.5		
M:F	4.88:1		

Table 2: Distribution of patients according to residence (n=100)

Residence	Frequency		total
	Male (n= 83)	***female (n= 17)***	
Rural	23(27.71)	4(23.52)	27
Urban	60(72.28)	13(76.47)	73

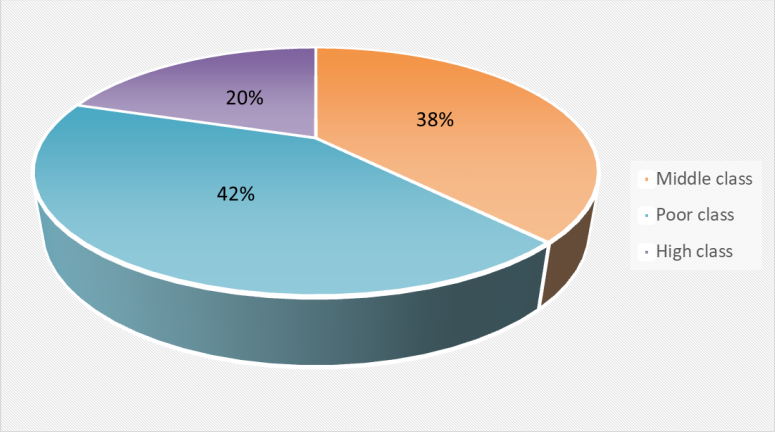

Figure- 1: Socioeconomic status of the study population (n=100)

Table 3: Assessment of lipid profile in patients with Lichen Planus (n=100)

Serum Lipid profile (mg/dl)based on NCEP/ATP III criteria	Frequency	Percentage
Total cholesterol (TC)		
< 200 mg/dl (desired)	72	72.0
201-239 mg/dl (borderline)	17	17.0
> 240 mg/dl (high)	11	11.0
Serum LDL cholesterol		
< 100 mg/dl (optimal)	68	68.0
101-129 mg/dl (beyond optimal)	15	15.0
130-159 mg/dl (borderline high)	10	10.0
160-189 mg/dl (high)	5	5.0
>190 mg/dl (very high)	2	2.0
HDL cholesterol		
< 40 mg/dl (low)	23	23.0
41-59 mg/dl (borderline)	54	54.0
> 60 mg/dl (high)	23	23.0
Serum TG in mg/dl		
< 150 mg/dl (ideal)	61	61.0
151-199 mg/dl (Borderline)	17	17.0
200-499 mg/dl (high)	14	14.0
> 500 mg/dl (very high)	8	8.0

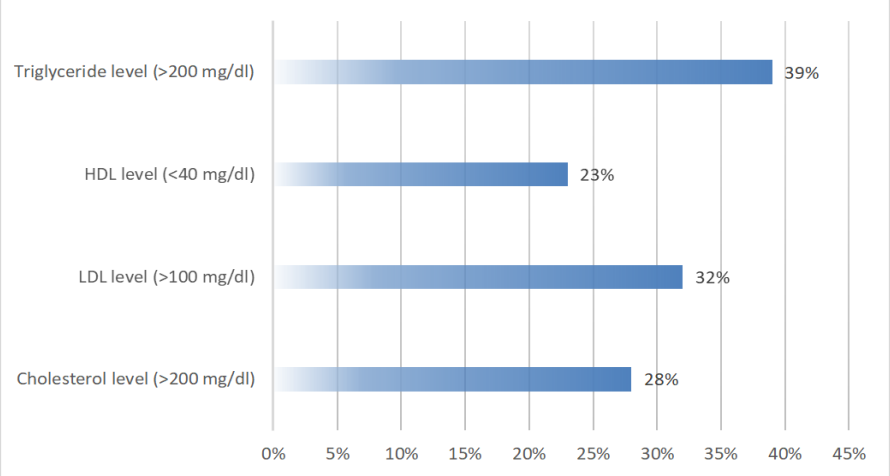

Figure- 2: Frequency of dyslipidaemia in Lichen Planus (n=100)

Table 4: Association of dyslipidaemia with gender variation (n=100)

Dyslipidemia	Frequency		Total
	Male (n= 83)	***female (n= 17)***	
Cholesterol level (>200 mg/dl)	24	4	28
LDL level (>100 mg/dl)	15	2	32
HDL level (<40 mg/dl)	19	4	23
Triglyceride level (>200 mg/dl)	33	6	39

DISCUSSION

In this study mean age of the patient was 53.42±8.5 years. Male and female ratio was 4.88:1. Study shows that frequency of LP was predominance at middle to elderly age in both sexes, but more female affected at middle age. Findings accordance with result of other study. More than two thirds of patients with LP are aged between 30-60 years; however, LP can occur at any age [16]. In a study age distribution was mean ± SD; 44.63 ± 15.12 year. There were 68 males (43 %) and 90 females (57 %), giving a male to female ratio of 1:1.3. Majority of the patients 92 (58 %) were in the age group from 20-49 years [4].

On evaluation of serum lipid level, mean value of total cholesterol level was 167.57 mg/dl ± 47.84. Abnormal Serum LDL cholesterol was detected in total 32 patients. Serum HDL cholesterol was significant in 23 patients. Serum triglyceride (TG) level was significantly raised in lichen planus patients, 61.0% cases had normal level of TG and mean triglycerides level was157.25 mg/dl ± 100.16.Among 100 patients

61.0% cases were found to have normal to borderline lipid profile and 39.0% cases had dyslipidemia- in a single or multiple patterns.

Findings consistent with result of other study. In a study [13] reported significantly higher levels of triglycerides (153.03 vs 107.91 mg/dl in case and control), total cholesterol (158.49 vs 143.47 mg/dl, in case and control), VLDL (30.61 vs 22.75 mg/dl, in case and control) and significantly lower levels of HDL (38.86 vs 45.78 mg/dl, in case and control) [13]. Previous study reported a higher than normal levels of triglyceride and total cholesterol in patients with lichen planus but they reported HDL levels less than the normal levels [17]. So, all findings accordance with result of our study.

CONCLUSION

Present study concluded that dyslipidemia is common in LP. Inflammatory processes could explain the connection between LP and dyslipidaemia, and possibly the other components of the described metabolic syndrome as well, due to the fact that a chronic infection plays a significant role in its pathogenesis. Therefore, results demonstrate that need for careful monitoring of patients with LP in order to identify, prevent and modify their cardiovascular risk factors.Our findings raise the hypothesis that in addition to aiding in the prediction of LP, changes in the levels of some of these factors through therapeutics or by lifestyle interventions may be beneficial in reducing the risk of dyslipidaemia in LP.

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