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STUDY OF CLINICAL PROFILE AND SERUM LIPIDS LEVEL IN PSORIASIS VULGARIS

Dermatology

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ABSTRACT

Background: Psoriasis is an immune-mediated inflammatory disease, characterized by epidermal hyper-proliferation, abnormal keratinocyte differentiation, angiogenesis, vasodilatation, and excess Th1/Th17 mediated inflammation, & affects 2-3% of the population worldwide. Beyond the skin, psoriasis is often associated with comorbidities such as dyslipidemia and obesity. Recently, many works of literature have shown its association with dyslipidemia. **Aims &objectives:** This study aimed to study serum lipid levels in psoriasis vulgaris patients. **Materials And Methods:** After obtaining approval from the institutional ethical committee, we performed a hospital-based, cross-sectional study on 50 adult patients with psoriasis vulgaris and equi-numbered age and sex-matched controls. All cases were subjected to a detailed history, personal details, and brief history about sites involved, onset, duration, progression, and associated comorbidities were recorded in pre-designed proforma. After obtaining written informed consent they investigated to see the association with serum lipid levels. **Results:** In our study out of fifty psoriasis vulgaris patients,9(18%) were hyperglycemic as compared to 6(12%) of controls, 5(10%) cases had high cholesterol levels same as controls, 22(44%) cases had low high-density lipid levels in comparison to 19(38%) of controls and 9(18%) cases had high very low-density lipid levels in comparison to 6(12%) of controls both data being insignificant and hyperlipidemia though seen in a good number of patients of psoriasis was not statically significant. Significance is assessed at a 5% level of significance. ANOVA had been used for comparing three or more groups, and the Chi-square and /or T-test for comparing two or more groups.

Limitations :

1. The number of patients was very low.
2. No histopathological correlation was done.

Conclusion: Amongst the various lipid parameters, significant elevation was found only in triglycerides while other parameters like HDL, VLDL, and Total Cholesterol did not show any significant association. Thus, we concluded from our study that psoriasis patients were not at any increased risk of cardiovascular comorbidities. Our study refuted any association of psoriasis with dyslipidemia in Indian patients.

KEYWORDS

HDL, VLDL, PSORIASIS

INTRODUCTION-

Psoriasis is a chronic, inflammatory skin condition that affects between 2–4% of the general population, with recent estimates suggesting over 125 million patients worldwide. 1 It is characterized by epidermal hyperproliferation and disordered maturation in genetically predisposed individuals. In psoriatic patients, an increased risk of hypertension, dyslipidemia, atherosclerosis, and depression was noticed.[2] Particularly patients with severe psoriasis have an increased risk of cardiovascular mortality that is independent of traditional cardiovascular risk factors. The release of inflammatory molecules and cytokines in psoriasis may play an important role in this association.[3] The etiology of psoriasis is unknown but genetic, metabolic, and immunologic mechanisms have been proposed. The loss of scale observed from the surface of the lesions in the course of the disease may be related to lipid disorders in the epidermis and the serum.[4]

MATERIALAND METHODS

STUDY DESIGN

This hospital-based, cross-sectional type study was conducted in the Department of Dermatology, venerology, and Leprosy at govt. Medical College & Hospital, Kota over 6 months among 50 patients attending the outpatient department. Informed consent was obtained from all patients to be a part of the study.

Inclusion Criteria:

1.All Untreated cases of psoriasis vulgaris in the age group of 12-75 years.
2. Either sex
3. Patients diagnosed clinically by the presence of well-defined, erythematous, white scaly plaques were included.
4. Patients were willing to be part of the study.

Exclusion Criteria:

1. Patients were not willing to take part in the study or unwilling to give their written consent for the study.
2. Patients with pustular psoriasis erythrodermic psoriasis, diabetes, family history of hyperlipidemia, and renal and liver failure.
3. Patients taking retinoids and lipid-lowering agents.

Methodology and type of data collected:

After obtaining clearance and approval from the institutional ethical committee, all diagnosed cases of psoriasis in the outpatient department of dermatology of Govt. Medical College, Kota was included in this study. All cases were subjected to detailed history including drug history, personal history, family history, past and present medical history, and drug intake other than for psoriasis, personal history of diabetes, and hypertension.

A 5ml venous blood sample was collected from both cases and controls, after overnight fasting (8 hours fast) and sent for laboratory biochemical estimations. This was followed by centrifugation and then the sample was processed immediately after collection. All the patients were subjected to general physical examinations and cutaneous examinations. All the patients were graded according to Psoriasis Area Severity Index (PASI) into 3 categories - Mild, Moderate, and Severe.

Score

The patients were classified based on Psoriasis Area Severity Index (PASI).

PASI:

This is a useful tool for monitoring the response of psoriasis to any therapeutic regimen. Four sites of affection - head (h), upper limbs (u), trunk (t), and lower limbs (l) are separately scored. Morphologic scoring of psoriasis plaques is done by evaluation of three parameters - erythema, induration, and desquamation, each of which is graded on a severity scale of 0 to 4 where 0 = nil, 1 = mild, 2 = moderate, 3 = severe and 4 = very severe. The addition of these scores for each site is multiplied by the grading for area-wise percentage involvement of that particular site in the following manner: 1 = less than 10% area, 2 = 10-29%, 3 = 30-49%, 4 = 50-69%, 5 = 70-89%, 6= > 90%. Since the four body regions (head, upper limbs, trunk, and lower limbs) represent about 10%, 20%, 30%, and 40% of body surface area respectively, they

are given corresponding weightage in scoring by multiplying their scores, by 0.1, 0.2, 0.3 and 0.4 respectively. Hence, the final formula for calculating the PASI score is as follows;

PASI = 0.1 (Eb +Ih+ Dh) A + 0.2(Eu + Iu + Du) A + 0.3(Et + It + Dt) A + 0.4 (El + Il + Dl)A

The score can vary between 0 and 72 in steps of 0.1.

One limitation of the PASI score lies in its inter-observer variation which evaluates by the same evaluates necessary and the consensuses are arrived after 2 clinician's observations.

In our study:

PASI
<3 was graded as MILD;

3-10 was graded as MODERATE;

>10 was graded as SEVERE

Determinations
1. Serum total cholesterol is estimated by the enzymatic method.

2. Serum triglyceride (S.TG) is determined by the enzymatic method.

3. Serum HDL Cholesterol (S.HDL-Ch) is estimated by the phosphotungstic method.

4.Serum VLDL cholesterol is calculated by the formula VLDL = S.TG/5.

OBSERVATION AND RESULTS
In our study, fifty patients were case group 31 male and 19 female(11 to 75 years, mean age (of 45.54 SD 14.37), while 50 control group 36 male and 14 female (11 to 75 years, mean age (of 39.92 SD 11.3).

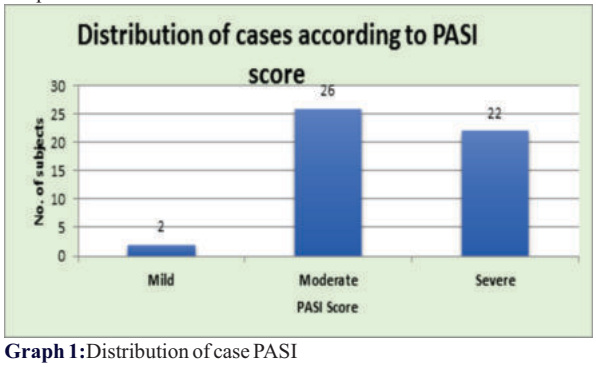
Table 1: Age-Wise Distribution Of Case And Control

Age group (years)	Case		Control		Total	
	N	%	N	%	N	%
11-20	3	6	2	4	5	5
21-30	4	8	9	18	13	13
31-40	11	22	16	32	27	27
41-50	13	26	16	32	29	29
51-60	12	24	5	10	17	17
>60	6	12	2	4	8	8
Total	50	100	50	100	100	100
Chi-square = 8.232 with 5 degrees of freedom; P = 0.156						

Table 2: Gender Distribution Of Case And Control

Gender	Case		Control		Total	OR (95% CI)
	N	%	N	%		
Female	19	38	14	28	33	1.576(0.8-3.654)
Male	31	62	36	72	67	-
Total	50	100	50	100	100	100
Chi-square = 0.724 with 1 degree of freedom; P = 0.395						

The severity of psoriasis was graded according to the PASI score. According to PASI, 4% of patients had mild psoriasis (PASI <3), 52% of patients had psoriasis of moderate Severity (PASI 3-10) whereas 44% had severe type (PASI >10). Results are displayed in Table 3 and Graph 1.



Graph 1: Distribution of case PASI

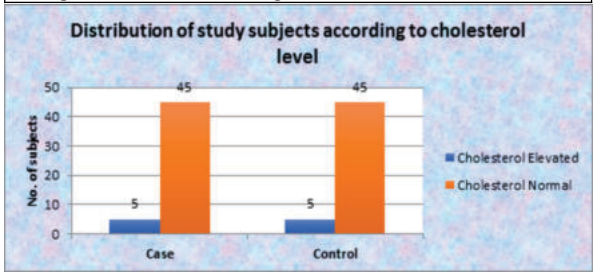
Table 3: Distribution Of Cases According To PASI Score

PASI	No. of patients	%	CI
Mild	2	4%	0.49 – 13.71
Moderate	26	52%	37.42 – 66.34
Severe	22	44%	29.99 – 58.75
Total	50	100	

In 5 (10%) of the cases of psoriasis elevated serum cholesterol values same as in 5(10%) of controls. Thus, no significant difference in cholesterol values was seen in cases and controls (p-value 0.739).

Table 4: Distribution Of Study Subjects According To Cholesterol Level

Cholesterol	Case		Control		Total	OR (95% CI)
	N	%	N	%		
Elevated	5	10	5	10	9	1.00 (0.27-3.69)
Normal	45	90	45	90	91	-
Total	50	100	50	100	100	100
Chi-square = 0.111 with 1 degree of freedom; P = 0.739						

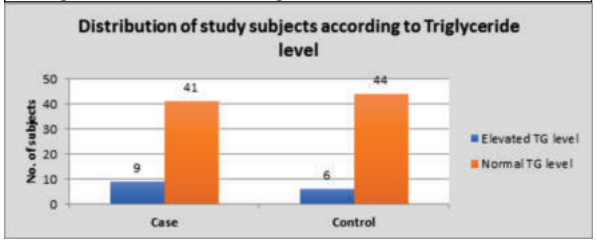


Graph 2: Distribution of case and control according to cholesterol level

In 9(18%) of the cases serum triglycerides elevated as compared to 6(12%) of the controls. Thus, no significant difference in triglyceride values was seen in cases and controls (p-value 0.575).

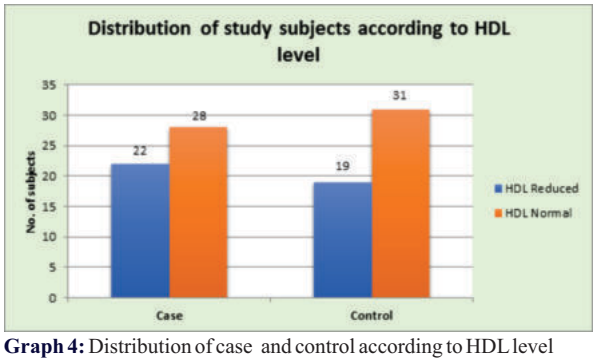
Table 5: Distribution Of Study Subjects According To Triglyceride Level

Triglyceride level	Case		Control		Total	OR (95% CI)
	N	%	N	%		
Elevated	9	18	6	12	13	1.61 (0.53-4.92)
Normal	41	82	44	88	87	-
Total	50	100	50	100	100	100
Chi-square = 0.314 with 1 degree of freedom; P = 0.575						



Graph 3: Distribution of case and control according to triglycerides level

In 22(44%) of the cases serum HDL reduced as compared to 19(38%) of the controls. Thus, no significant difference in HDL values was seen in cases and controls (p-value 0.684).



Graph 4: Distribution of case and control according to HDL level

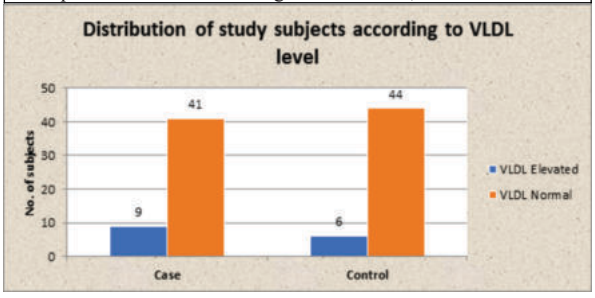
Table 6: Distribution Of Study Subjects According To HDL Level

HDL	Case		Control		Total	OR (95% CI)
	N	%	N	%		
Reduced	22	44	19	38	41	1.28 (0.58-2.85)
Normal	28	56	31	62	59	-
Total	50	100	50	100	100	100
Chi-square = 0.165 with 1 degree of freedom; P = 0.684						

In 9(18%) of the cases serum VLDL was elevated as compared to 6(12%) of the controls. Thus, no significant difference in VLDL values was seen in cases and controls (p-value 0.575).

Table 7: Distribution Of Study Subjects According To VLDL Level

VLDL	Case		Control		Total	OR (95% CI)
	N	%	N	%		
Elevated	9	18	6	12	13	1.61 (0.53-4.92)
Normal	41	82	44	88	87	-
Total	50	100	50	100	100	100
Chi-square = 0.314 with 1 degree of freedom; P = 0.575						



Graph 5: Distribution Of Case And Control According To VLDL Level

Table 8: Comparision Of Various Parameters Among Study Subjects

Characteristics	Case	Control	P value
Age	45.54 ± 14.37	39.92 ± 11.3	0.032 (S)
Triglycerides	125.82 ± 54.29	100.92 ± 43.23	0.013 (S)
VLDL	24.38 ± 11.42	22.06 ± 7.32	0.229
Cholesterol	166.4 ± 52.17	172.7 ± 28.65	0.456
HDL	49.66 ± 28.81	48.38 ± 17.51	0.789

Another important conclusion that was deducted from our study was that there was no variation in the parameters of lipid profile according to the severity of Psoriasis judged based on the PASI score. No trend was observed through mild, moderate, and severe cases of psoriasis. This finding has been displayed in Table 14.

Table 9:comparision Of Various Parameters Concerning PASI Score Among Cases

	PASI			P value
Characteristics	Mild	Moderate	Severe	
Age	38.5 ± 13.43	48.92 ± 13.07	42.18 ± 15.46	0.213
Triglycerides	159.5 ± 85.56	120.58 ± 38.98	128.95 ± 67.58	0.591
VLDL	31 ± 18.38	24.04 ± 9.8	24.19 ± 13.01	0.712
Cholesterol	149.5 ± 16.26	167.46 ± 46.12	166.68 ± 61.46	0.899
HDL	38.5 ± 19.09	58.96 ± 31.26	39.68 ± 23.1	0.056

DISCUSSION

Psoriasis is a paradigm of a chronic and relapsing inflammatory skin disease that so far was supposed to be restricted to the skin except for Psoriatic arthritis. There has been a lot of recent research on its consideration as a systemic disease with the researchers being of the view that the dermatological manifestations represent only a part of the spectrum. This study was undertaken to study one such debatable association with abnormalities in the lipid profile and psoriasis vulgaris patients.

Half a century ago Lea Jr. et al. reported increased serum lipid levels in psoriasis patients. Later much research was carried out to find the concentration of lipids in the scales of psoriasis patients. Subsequently, multiple observational studies were carried out in a heterogeneous study population consistently pointing towards dyslipidemia. Aberrant lipoprotein composition at disease onset observed in a study indicates a predisposition of psoriasis patients to develop lipid abnormalities .[5]

In our study 50 cases and 50 age, sex-matched controls were recruited. The mean age of cases was 45.54 ±14.37 years while the mean age of the controls was 39.92 ±11.3 years. The maximum number of patients 13(26%) belonged to the age group of 41-50 years.

Out of 50 cases, 31 were males and 19 were females. Male: female ratio was 1.6:1. A high male preponderance seen in our study correlates with other published studies. Inderjeet Kaur et al[6] revealed a sex ratio of 2.3:1, whereas Mehta et al[7] reported a sex ratio of 4:1 in their studies. Thus, the sex ratio in our study correlated with the above literature. The ratio in controls was 2.5:1.

In our study, PASI was used to grade the patients. As definite literature regarding the classification of PASI into mild, moderate, and severe is lacking, we classified the patients depending on the available studies. According to PASI,2(4%) had mild psoriasis (PASI <3), 26(52%) of patients had psoriasis of moderate severity (PASI 3-10) whereas 22(44%) had severe type (PASI >10). Thus, 28(56%) of patients had PASI scores less than 10, which correlates with other studies.[8]

Serum lipids levels were analyzed in cases and compared with controls. We did not find any difference in the total serum cholesterol composition in cases and controls. 5 (10%)of the cases of psoriasis had elevated serum cholesterol values same as 5(10%) of controls. Thus, no significant difference in cholesterol values was seen in cases and controls (p-value 0.739). The mean value of serum cholesterol in cases was 166.4±52.17 mg/dl which was comparable to the mean value in controls 172.7±28.65 mg/dl (p-value 0.456). Mallbris[8] et al in a study on 200 psoriasis cases showed elevated total serum cholesterol but the change was not significant. Rocha-Pereira[9] reported increased cholesterol values in 38 psoriasis patients, whereas Piskin[10] et al showed significantly raised levels in 100 patients.

The serum triglyceride composition varied in cases and controls. The mean value in cases was 125.82±54.29 which was significantly higher than the mean value in controls which was 100.92±43.23 (p-value: 0.013). Serum triglycerides have been reported to be high in different sources.[11]

The mean values of HDL in cases and controls were 49.66±28.81 and 48.38±17.51respectively, thereby showing no significant association (p-value 0.789).

Piskin et al study also reported normal levels of HDL in psoriatic patients while Rocha-Pereira[9] reported decreased levels of HDL in psoriatic patients.

The mean values of VLDL in cases and controls were 24.38±11.42 and 22.06±7.32 respectively. No significant association was seen in VLDL values between cases and Controls (p-value: 0.229).

Other studies[8,9] have reported an increase in the levels of VLDL in psoriatic cases. Thus various studies reported contradictory results. In our study, a significant elevation of serum TGs was observed, whereas VLDL, HDL, and t.cholesterol levels were comparable in cases and control.

Another important conclusion that was deducted from our study was that there was no variation in the parameters of lipid profile according to the severity of psoriasis judged based on the PASI score. No trend was observed through mild, moderate, and severe cases of psoriasis vulgaris.

CONCLUSION

Psoriasis is one of the most common dermatological conditions seen in the daily practice. There has been a lot of recent research on its consideration as a systemic disease with the researchers being of the view that the dermatological manifestations represent only a part of the spectrum. A recent review of the literature suggests that psoriasis is associated with dyslipidemia. Strong associations with dyslipidemia, obesity, diabetes, and increased cardiovascular morbidities apart from common comorbidities like psoriatic arthritis and depressive disorder have been reported.

Psoriasis has a male preponderance and in our study male: female ratio

was 1.6:1. Maximum number of patients13(26%) belonged to the age group of 41-50 years. 26(52%) of the patients had moderate disease while 22(44%) of the patients had severe disease.

Amongst the various lipid parameters, significant elevation was found only in triglycerides while other parameters like HDL, VLDL, LDL, and Total Cholesterol did not show any significant association. Further, there was no correlation of abnormality in lipid parameters with the severity of the disease. There was also no influence of age of onset of the disease with the abnormality in lipid parameters. Thus, we concluded from our study that psoriasis patients were not at any increased risk of cardiovascular comorbidities.

Although there have been plenty of studies from the West reporting an association of psoriasis with dyslipidemia, there are no large-scale Indian studies evaluating Asian patients. The present study was an endeavor in this regard.

Our study shows no significant correlation between lipids with disease severity and duration. This strengthens the fact that psoriasis is a systemic disease. We can conclude that severe psoriasis cases should be screened for lipid abnormalities which can help in the early detection of lipid dysfunction and cardiovascular comorbidity. Further, most such studies have been conducted on patients on treatment while ours is the first study on newly diagnosed patients before the initiation of any therapy.

This has important implications for treating dermatologists as it allows them to be more adventurous and aggressive in treating these patients while simultaneously saving the cost of expensive unnecessary investigations that they may resort to rule out dyslipidemia. Amongst the various lipid parameters, significant elevation was found only in triglycerides while other parameters like HDL, VLDL, and Total Cholesterol did not show any significant association. Thus, we concluded from our study that psoriasis patients were not at any increased risk of cardiovascular comorbidities. Our study refuted any association of psoriasis with dyslipidemia in Indian patients.

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