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ORIGINAL RESEARCH

A STUDY ON RELATION OF DYSLIPIDEMIA IN PSORIASIS PATIENTS IN TERTIARY CARE HOSPITAL

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ABSTRACT:

Background:To assess the statistically significant difference in the serum lipid profile levels in the psoriasis cases and healthy controls and to evaluate atherogenicity in psoriatic patients which is a risk factor for cardiovascular disease.Psoriasis is a common and recurrent proliferative inflammatory skin disease that has been influenced by abnormal plasma lipid metabolism, genetic, environmental, viral, immunological factors and with high frequency of cardiovascular morbidity and mortality. Biochemically Psoriasis leads to increased synthesis and degradation of nucleoproteins, it is also associated with changes in blood biochemistry. This study was done to establish the correlation of lipid profile in the psoriasis patients and also to evaluate the risk of atherogenicity in psoriatic patients which is a risk factor for cardiovascular disease. Blood samples were analysed for the following parameters in lipid profile, total cholesterol, LDL, HDL, Triglycerides. A significant relation was found with dyslipidemia and increased risk of atherogenicity in psoriasis disease and severity of diseases in which the risk factors and secondary causes of hyperlipidemia were excluded.

Materials and Methods: Present study was done at Department of Biochemistry, Maheswara Medical College, Hyderabad and analysed fasting lipid profile in 160 patients diagnosed with mild to severe psoriasis and 160 age and gender matched healthy subjects as the control group in the period of 20 months.

Results: Subjects presented considerable risky elevation in lipid profile, serum total cholesterol ($p<0.001$), triglyceride (p 0.002), LDL-cholesterol ($p<0.001$), VLDL-cholesterol ($p<0.001$) and free fatty acids (<0.001) were found to be significantly higher than in control group. Significant decrease in statistical analysis was observed in HDL ($p<0.001$) levels of the two groups. Significant positive correlation in total cholesterol,

LDL, VLDL and FFA was found between mild, moderate and severe psoriasis (PASI score) as compared with controls.

Conclusion: Present data suggest that psoriasis patients must be considered as a group at high risk for cardiovascular, since psoriasis per se seems to be associated with risk changes in the lipid profile. We conclude that psoriatic patients should be evaluated and followed up for the risk of hyperlipidemia and cardiovascular diseases.

Keywords: Dyslipidemia, Psoriasis

INTRODUCTION:

Psoriasis is a chronic recurrent papulosquamous disorder. Clinically reflected by scaly erythematous papule or plaque.[1] It is due to epidermal hyperplasia increased mitotic activity of basal cell layer results in rapid epidermal turn over from 25 days to 5 days. Psoriasis is a disease influenced by genetic, environmental, viral, immunological factors. Biochemically Psoriasis leads to increased synthesis and degradation of nucleoproteins, it is also associated with changes in blood biochemistry. The pathophysiology of psoriasis includes activation of helper T cells with production of pro inflammatory cytokines which maintain the pro-inflammatory environment in psoriatic skin. these cytokines also cause obesity, dyslipidaemia, increased oxidative stress. Dyslipidaemia is mostly seen in psoriasis patients.[2-5]Dyslipidaemia includes high serum triglycerides, LDL, VLDL and low HDL concentrations. The chronic inflammations, a main feature of psoriasis, are associated with hyperlipidaemia. Chronic inflammation in psoriasis leads to increased insulin-like growth factor - II (IGF-II) in the skin and blood of psoriatic patients Insulin-like growth factor - II (IGF-II) promotes epidermal proliferation and is also linked to hyperlipidemia and in promoting atherosclerosis.[6]

MATERIALS & METHODS:

The study will be done during the above-mentioned study period i.e. from Nov 2020- May 2022 (20 months) in Department of Bichemistry, Maheswara Medical College, Hyderabd. This is a prospective and analytical type of study.

Around a 160 cases and age and gender matched 160 controls were included after detailed history and clinical examination.

Blood samples taken from the following subjects and the following parameters in lipid profile, total cholesterol, LDL, HDL, Triglycerides, were analysed in Beckman coulter auto analyser, AU5800.

Inclusion Criteria

- No history of any topical or systemic drug therapy for at least 3 months.
- Patients with scaly papules and plaques.
- Both genders and age between 18-65 years
- Newly diagnosed patients.
- Patients who gave the consent.

Exclusion Criteria

- Patient not giving consent for sample collection.
- Long history of alcohol intake, smoking, hypertension, diabetes mellitus, BMI>30 kg/m2) personal or family history of metabolic diseases.
- Patients on medication which affects lipid metabolism (beta blockers, thiazides, retinoids)
- Pregnant ladies, females on oral contraceptives, women with menopausal age group.

Statistical Analysis: The data obtained was analysed and the difference in the mean of various parameters were compared using students t test.

RESULTS:

Table 1: Age Wise Distribution of Cases

Age	Case	Control
18-30	131	117
31-50	20	34
51-65	9	9
	160	160

Majority of the patients, 131 (81.87%) were in the age group of 18-30 years, followed by 20 (12.5%) cases in the age group 31-50 years and 9 (5.65%) cases in age group 51-65 years.

Table 2: Age and sex wise Distribution of Cases

Sex	Case	Age group	No	Percentage%	Control	Age group	No	Percentage%
Male	122 (76.25%)	18-30	103	84.42%	130 (81.25%)	18-30	96	73.84%
		31-50	12	9.83%		31-50	28	21.53%
		51-65	7	5.73%		51-65	6	4.61%
		Total	122	100%		Total	130	100%
Female	38 (23.75%)	18-30	28	73.68%	30 (18.75%)	18-30	21	%
		31-50	8	21.05%		31-50	6	%
		51-65	2	5.26%		51-65	3	%
		Total	38	100%		Total	30	100%
Total	160				160			

Maximum cases 122 (76.25%) were males of which predominantly 103 (84.42%)were under18-30 age group followed by 12 (9.83%), 7 (5.73%) were under thecategory of 31-50 and 51-65 respectively. Out of 160 subjects 38 (23.75%) were female in which prime part 28 (73.68%) were in the age range of 18-30 and 8 (21.05%), 2 (5.26%) were coming after falling in the age group of 31-50 and 51-65 apart.

Table 3: Correlation of lipid profile in both groups

	Case (Mean)	Control (Mean)	Std. deviation		P value
			Case	Control	
Total cholesterol mg/dl	255.25±29.25	150.58±10.25	46.846±2.85	28.563±6.25	<0.001
HDL mg/dl	31.14±11.20	45.78±16.87	3.452±0.25	8.259±1.23	<0.001
LDL mg/dl	140.69±29.14	110.23±9.46	51.108±12.36	22.602±0.96	<0.001
VLDL mg/dl	36.22±17.36	22.17±5.27	19.524±5.97	8.996±2.22	<0.001
Triglycerides mg/dl	142.89±56.39	120.99±19.74	96.004±12.08	66.235±4.36	0.002
FFA mmol/L	4.3±1.65	0.96±1.85	29.991±9.02	9.012±1.01	<0.001

Table 4: Overall Age and Sex Wise Comparison of Dyslipidemia

Dyslipidaemia	Case	Male			Total %	Female			Total %	Control	%
Significant	148	Age	No	%	91.80	Age	No	%	94.73	11	6.87
		18-30	96	78.68		18-30	26	68.43			
		31-50	11	9.01		31-50	8	21.05			
		51-65	5	4.09		51-65	2	5.26			
	Total no		112				36				
No significant	12	18-30	7	4.375	8.20	18-30	2	5.26	5.27	149	93.13
		31-50	1	1.62		31-50	0	-			
		51-65	2	2.21		51-65	0	-			
	Total no		10	100%	100%		2	100%	100%	160	100%

[Table 3] compares serum lipid levels in cases and control. Mean cholesterol in cases was 255.25±29.25mg/dl and is significant higher in comparison with controls which was 150.58±10.25 mg/dl. The mean triglycerides in both cases and controls were 142.89±56.39mg/dl and 120.99±19.74 mg/dl, respectively, noteworthy higher in cases. Mean LDL was also convincingly higher in cases 140.69±29.14 mg/dl compared with controls 110.23±9.46 mg/dl, p value <0.001.

The mean of VLDL was 36.22±17.36 mg/dl in cases while in controls was 22.17±5.27 mg/dl, p- value < 0.01. There was a steep decrease in mean HDL in cases vs controls was observed with mean values of 31.14±11.20 mg/dl and 45.78±16.87 mg/dl, respectively.

All parameters (cholesterol, triglyceride, LDL) were statistically significantly raised in cases as compared to controls and HDL was significantly lower in cases when compared with controls, p value < 0.001.

The overall age and sex wise correlation of dyslipidemia in [Table 4] shown majority (112) of male subjects (75.67%) shown significant raise in total lipid profile more profoundly in 96 cases under age group of 18-30 (78.68%) followed by 11 cases in 31-50 age (9.01%) and 5 of 51-65age group (4.09%) respectively. Out of 38 (23.75%) female cases 36 (94.73%) shown very significant hike in total cholesterol, LDL, VLDL and FFAs markedly under the age range of 18- 30 (68.43%) followed by 31-50 (21.05%) and 51-65 (5.26%) respectively. Out of total 160 subjects 148 (112M+36F, 92.5%) were shown significant elevation in all parameters of lipid profile in comparison to 11 (6.87%) controls.

There were 12 (10M+2F, 8.20%) subjects shown insignificant raise as compared to 149 (93.13%) controls.

Table 5: Comparison of dyslipidemia and severity

Dyslipidemia	No of cases		No	Percentage %
Significant	148 (92.5%)	Mild	28	17.5%
		Moderate	36	22.5%
		Severe	84	52.5%
No significant	12(7.5%)	Mild	5	3.12%
		Moderate	4	2.51%
		Severe	3	1.87%
Total			160	100%

Out of total 160 cases 148 (92.5%) shown significant dyslipidemia of which major 84 (52.5%) part includes severe psoriasis and followed by moderate 36 (22.5%) and mild 28 (17.5%) subjects and 12 (7.5%) shown insignificant dominantly in mild 5 (3.12%) followed by moderate 4 (2.51%) and severe 3 (1.87%) respectively.

DISCUSSION:

Psoriasis is characterized by well-demarcated, red, scaly, indurated plaques symmetrically distributed over extensors and scalp. Although the exact cause of psoriasis is still rolled, the emerging evidence suggests that psoriasis is a multifaceted disease initiated by the interface of numerous genetic factors, immune system, and ecological causes.[7-9] An increase in frequency of developing cardiovascular disease and metabolic syndrome has been reported in psoriatic patients as compared to general population. The changes in the lipid composition in psoriasis patients can be due to primary events or secondary events or due to medications like retinoids.[10-12] This is still a matter of debate and conflict about what is the exact cause of the development of dyslipidemia in psoriasis patients leading to multifactorial atherosclerosis and cardiovascular disorders. Several genetic, hormonal, environmental and other factors play an important role in the development of atherosclerosis.[13,14]

Many researches have showed that psoriasis leads to increase in atherosclerosis and increase in the incidence of cardiovascular events but researches showing dyslipidemia in psoriasis patients are lacking.[15-17]

Our study, we found significant correlation between mild, moderate and severe psoriasis and dyslipidemia.

In 1978, Madonald and Calabresi proposed a predisposition to occlusive vascular diseases in patients with psoriasis. Rocha-Pereira reported increased serum total cholesterol, VLDL-cholesterol, LDL-cholesterol and a decrease HDL-cholesterol levels. Piskin in his study showed serum total and LDL-cholesterol was significantly higher in psoriasis group than the control group.[14] Amina Hamed Ahmad studied lipid profile in psoriatic patients and found that total cholesterol, triglycerides, VLDL and LDL were significantly higher than those of healthy subjects while HDL was significantly lower in psoriatic patients compared to controls might be due to decreased apoA1. Vanizorkural et al., Doulat Rai Bajaj et al., Akhyani et al., Iyer et al and many studies as shown in [Table 6] studied lipid profile in psoriatic patients and found that totalcholesterol, triglycerides and LDL-C levels in patients with psoriasis were

significantly higher. The present study on psoriatic patients correlated with the previous studies.

Authors	Year	Sample no	P value	Conclusion
P Rocha-Pereira,[16]	2001	48	<0.01	Psoriasis must be considered as a group at high risk of cardiovascular diseases
Nisa and Qazi,[9]	2010	300	<0.05	There is a significantly higher prevalence of metabolic syndrome in psoriasis patients as compared to general population
Gupta et al.[10]	2011	100	<0.001	Hyperlipidemia along with increase in lipid peroxidation and decrease in antioxidants levels are a feature of psoriasis.
Santos et al,[17]	2013	72	0.132	The occurrence of dyslipidemia and obesity in patients with psoriasis may alter the quality and expectancy of life of these patients,
Priya Hilda Dsouza,[8]	2013	24	<0.001	Psoriasis patients must be considered as a group at high risk for cardiovascular disease, since psoriasis per se seems to be associated with risk changes in the lipid profile.
Salihbegovic et al,[6]	2015	70	0.0001	Psoriasis is connected with dyslipidemia
Asha K, Singal et al,[15]	2017	150	<0.001	LDL oxidation and reactive oxygen species in addition to inflammatory markers may play a pivotal role in inducing atherosclerosis in patients of psoriasis.
Uzma Akbar Mirza,[18]	2018	106	<0.001	Dyslipidemia is highly associated with psoriasis regardless of age, gender and severity of disease.
ChaoyangMiaoa, Jing Lic,[19]	2019	222	<0.001	Dyslipidemia was more common in psoriatic patients than in controls, and psoriasis might be associated with the abnormal lipid metabolism
Present study	2022	260	<0.001	Existed a strong relationship between psoriasis and increased lipid profile predisposing psoriatic subjects to cardiovascular diseases

CONCLUSION:

Psoriasis is a chronic, auto-immune disease which should be treated with ultimate care to reduce the exacerbations especially in winter season. In our study, Serum lipid profile levels were drastically increased in the patients with psoriasis when compared with the controls. This study revealed that there existed a strong relationship between psoriasis and increased lipid profile predisposing psoriatic subjects to cardiovascular diseases. Regular follow-ups along with estimation of routine and special biochemical parameters will reduce the risk of cardiovascular complications.

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