Original Article

Lipid profile in patients with psoriasis presenting at Liaquat University Hospital Hyderabad

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Abstract

Objective: To determine the lipid abnormalities in patients with psoriasis and compare it with healthy controls.

Methods: Across-sectional controlled study was conducted at the Department of Dermatology Liaquat University Hospital Hyderabad from January 2007 to November 2007.

The study included 158 consecutive patients; among which 88 were males (44 patients and 44 controls) and 70 females (35 patients and 35 controls). The patients with psoriasis having less than 30% body involvement were included in the study. Patients with severe psoriasis, high BMI (.30kg/m2), hypertension, diabetes, smoking, alcohol consumption and personal or family history of hyperlipedemia were excluded. The patients were examined clinically and findings recorded on a pre-designed proforma. Fasting lipids were measured using SELECTRA XL chemistry analyzer using Spin react kits (made in Spain) by direct method.

Results: All patients had psoriasis involving less than 30% of body surface. Their ages ranged from 18 years to 68 years (mean 37±7.96 years). Family history of disease was positive in 10 (6.32%) patients. 134 (84.8%) had plaque type psoriasis, 10 (6%) had in addition scalp and nail involvement, 05 (3.16%) guttate lesions, 05 (3.16%) had palmoplantar lesions while remaining 04 (2.43%) comprised of hyperkeratotic and flexural psoriasis. The duration of disease ranged between 18 months to 10 years with a mean of 4.5 ± 1.89 years.

Serum cholesterol, triglycerides and low density lipoprotein (LDL) cholesterol were significantly higher than in the normal control group (P <0.01). There was no significant statistical difference in serum levels of very low density lipoprotein cholesterol (VLDL) and high density lipoprotein cholesterol (HDL-C) between the two groups.

Conclusion: Psoriasis is an independent risk factor for hyperlipidaemia and its possible subsequent sequelae such as obstructive vascular disease (JPMA 59:512; 2009).

Introduction

Psoriasis is an auto-immune disorder characterized by erythematous scaly plaques over extensor aspects of the body.[1] It affects about 2-3% of world population. According to world psoriasis day consortium about 125 million people all over the world suffer from this disease.[2]

The pathophysiology of psoriasis includes an increase in antigen presentation by dendritic cells, their presentation to T-cell with resultant T- cell activation and secretion of type 1 (TH1) cytokines by these cells. These include -interferon, interleukin- 2 and tumour necrosis factor alpha (TNF-). These cytokines induce inflammatory changes in epidermis producing thick scaly red plaques and in some patients, arthritis.[3]

Psoriasis has been associated with an abnormal plasma lipid metabolism and diabetes possibly related to alterations in insulin secretion and sensitivity.[4] There is also increased oxidative stress with high frequency of cardiovascular events. High prevalence of cardiovascular events is related to severity of psoriasis.[5] There are several possible explanations for the increased prevalence of cardiovascular morbidity and mortality in patients with psoriasis Whether this is due to the chronic inflammatory disease process itself or to confounding variables such as tobacco smoking, obesity and sedentary life styles remains to be determined. Mallbris and colleagues investigated whether individuals with newly diagnosed psoriasis have abnormal profiles when compared with age-and gender matched controls.[6] Other co-morbid factors that increase the risk of abnormal lipid metabolism may be found in these patients. These include higher body mass index (BMI) (> 30kg/m^2), family history of hyperlipidaemia, sedentary life style, high fat diet and patient taking retinoids or cyclosporine for the disease.

Data is scarce regarding prevalence and incidence of psoriasis in our country but it is assumed (on basis of daily OPD attendance) to be a common problem.

Hence, the aim of present study was to determine lipid abnormalities in psoriasis patients and further to establish its role in the increased incidence of vascular events.

Patients and Methods

A total of 44 consecutive male and 35 female patients with psoriasis were enrolled. Similar number of non-psoriatic patients i.e. 44 male and 35 female with matching ages were included as controls. All patients aged more than 18 years of either gender and with various grades of severity were included in study. An informed consent was sought from them after due explanation of purpose. The data was entered into a pre-structured standard proforma. The subjects for control group were taken from healthy paramedical staff, volunteers and patients attending skin out patient department for cosmetic problems like acne and pigment disturbances. Patients with all clinical forms of psoriasis such as plaque, hyperkeratotic, palmoplantar, nail, scalp and flexural were included in the study. They were divided into three broad groups according to severity of the disease. Patients with less than 30% body involvement were graded as mild, 30-50% as moderate and those having more than 50% involvement of body surface as severe. Rule of nine was used to determine this percentage. Only patients with mild disease (< 30% body involvement) were included in study.

The patients with moderate to severe psoriasis and erythrodermic and pustular forms were not included in study because of systemic involvement in these forms. Other exclusion criteria were: long history of alcohol intake, smoking, hypertension, diabetes, BMI > than 30kg/m^2 or with personal or family history of metabolic disease, patients taking drugs known to affect lipid or carbohydrate metabolism such as beta blockers, thiazides, corticosteroids, cyclosporine, retinoids and lipid lowering drugs were also excluded. Similarly female pregnant patients or those taking oral contraceptive for at least 6 months or women in their menopausal stage were excluded from history.

After recording bio data (name, age, address, occupation) patients were asked about the age of onset, duration, and evolution of their disease, drug and family history of disease. Questions focused to exclude the conditions mentioned under exclusion criteria were also asked.

A detailed physical examination was conducted to note the sites, degree of erythema, thickness of plaques and amount of scaling over plaques. Psoriasis area and Severity Index (PASI score) was generated for each patient to gauge the severity of psoriasis.

A thorough systemic examination was conducted every time by the same qualified physician to exclude systemic disease that would act as a confounding variable.

After fasting of 14 hours, 5 ml of venous blood was drawn in sterile syringe and submitted to the laboratory for estimation of total cholesterol, low density lipoprotein (LDL) cholesterol, and serum triglyceride levels. These tests were done on SELECTRA XL chemistry analyzer using Spin react kit (made in Spain). Direct method was used for this test as it is more authenticated.

Statistical Analysis: The data was analyzed using SPSS software version 11.0. The student t test was applied to compare the means (2- tailed) among continuous parameters at 95% confidence interval. A p value ≤ 0.005 was considered significant.

Results

The study included a total of 158 patients. Among them 79 had psoriasis (44 male and 35 female) and 79 were healthy controls (44 male and 35 female). Their ages ranged from 18 to 68 years with a mean of 37 ± 7.96 years. All had psoriatic lesions that involved less than 30% of body surface. Family history of psoriasis was positive in 10 (6.32%) patients. The majority of patients (n= 134, 84.8%) had plaque type psoriasis, 10 (6%) had in addition scalp and nail involvement, 05 (3.16%) had guttate lesions, 05 (3.16%) palmoplantar lesions while remaining 04 (2.43%) comprised of hyperkeratotic and flexural psoriasis. The duration of disease ranged between 18 months to 10 years with a mean of 4.5±1.89 years. History of seasonal variation of disease was positive in 42 (26.58%) patients. Out of these 28 (66%) noticed exacerbation of disease in winter while 14 (34%) in summer season.

In the patient group serum cholesterol, triglycerides

Table-1: Lipid profile in patients and control.

Parameters	Group (n = 158)		Range (min-max)	P value
	Patient (n = 79)	Control (n = 79)		
Cholesterol (mg/dl)	215.06 ± 19.75	179.44 ± 18.40	148 – 275	< 0.001*
LDL (mg/dl)	148.24 ± 11.07	117.03 ± 15.35	80 – 180	< 0.001*
TG (mg/dl)	175.91 ± 46.55	147.12 ± 38.61	59 – 271	< 0.001*
HDL (mg/dl)	37.81 ± 10.78	41.41 ± 9.72	23 – 70	0.02
VLDL (mg/dl)	37.81 ± 10.78	36.68 ± 7.87	23 – 69	0.45

Results are expressed as Mean ± Standard Deviation
* P value is statistically highly significant.

Table-2: Lipid Profile in Male Psoriatic Patients (n=44) and Controls (n=44).

		Mean ± SD	Min - Max	P value
Total Cholesterol (mg/dl)	Patients	221.22 ± 20.22	190 – 275	< 0.001
	Controls	189.65 ± 13.87	160 – 220	
Triglycerides (mg/dl)	Patients	182.15 ± 49.08	69 – 270	< 0.001
	Controls	154.02 ± 40.42	59 – 230	
HDL-Cholesterol (mg/dl)	Patients	39.75 ± 11.30	23 – 69	> 0.05
	Controls	42.20 ± 10.49	25 – 70	
LDL- Cholesterol (mg/dl)	Patients	148.50 ± 10.43	125 – 165	< 0.001
	Controls	118.02 ± 14.81	80 – 143	
VLDL-Cholesterol (mg/dl)	Patients	37.75 ± 5.77	25 – 48	> 0.05
	Control	33.70 ± 5.65	23 – 45	

Table-3: Lipid Profile in Female Psoriatic Patients (n=35) and Controls (n=35).

		Mean ± SD	Min - Max	P value
Total Cholesterol (mg/dl)	Patient	207.31 ± 14.66	180 – 248	< 0.001
	Control	166.60 ± 15.11	148 – 200	
Triglyceride (mg/dl)	Patient	168.05 ± 42.56	79 – 243	< 0.001
	Control	138.45 ± 34.86	69 – 210	
HDL-Cholesterol (mg/dl)	Patient	35.37 ± 971	23 - 58	> 0.05
	Control	40.42 ± 8.71	24 - 60	
LDL Cholesterol (mg/dl)	Patient	147.91 ± 11.97	123 – 180	< 0.001
	Control	115.80 ± 16.14	80 – 147	
VLDL Cholesterol (mg/dl)	Patient	30.65 ± 4.52	24 – 42	> 0.05
	Control	30.97 ± 3.90	23 – 38	

and low density lipoprotein cholesterol (LDL-cholesterol) were significantly higher than those in control group. While the difference in means of high density lipoprotein cholesterol (HDL-cholesterol) and very low density lipoprotein cholesterol between two groups was not significant statistically.

The results are depicted in Table 1, 2 and 3.

Discussion

Disorders mediated by Th1 cytokines are associated with an increased risk of atherosclerosis and vascular events; hence, there has been much interest in determining lipid abnormalities and other risk factors for atherosclerosis in psoriatic patients.[7] Lea, Cornish and Block were the first to report increased serum lipids in patients with psoriasis about 50 years ago.[8] Since then many studies have been done on this subject which consistently report a raised prevalence of lipid abnormalities in psoriasis.[9-12]

There is increased prevalence of coronary artery disease in our population.[13] It is expected to rise further by Th1 mediated diseases like psoriasis. The predisposition to vascular occlusive events in psoriasis and psoriatic arthritis has increased possibly because of raised plasma lipids and other inflammatory mediators.[14] Therefore it is prudent to know and prevent these co morbid conditions in psoriasis. This predisposition seems to be related to the severity of psoriasis.[15] However the severity of disease was not classified in this study.

There are controversial results about serum cholesterol levels in psoriasis; Some reporting high,[16] low,[17] and some even normal levels.[18] In the presented study the cholesterol levels were significantly higher in patients as compared to controls.

Similarly LDL-cholesterol levels of psoriasis patients have also been reported to be high,[19] or normal[20] in various studies. LDL-cholesterol was significantly higher in concentration in patients in this study.

A similar controversy also exists regarding levels of serum triglycerides. Normal,[21] high and low[17] levels have been reported. There was no significant difference of level of triglycerides between two groups in our study.

A significant difference in the levels of HDL-cholesterol and VLDL — cholesterol between two groups was not seen in this study. The results match with that done by Piskin S[18] and contrast with that by Reyno et al.[22]

In the presented study, males were found to have greater abnormalities in serum lipids as compared to females. This may be because the majority of female patients were younger as compared to males and had not

reached their menopause.

The reasons for dyslipidaemia in psoriasis may be multiple. The structural and functional changes in digestive tract,[23] immune mechanisms involving IL-6[24] and tumour necrosis factor, and C-reactive proteins[25] and cellular oxidative stress[26] may be responsible for altered lipid metabolism.

Thus in consensus with previous studies this, study also shows an increased prevalence of lipid abnormalities in psoriasis. This information fact may suggest an increase in the already existing high prevalence of cardiovascular events in our population. Hence, is recommended early screening and treatment of hyperlipidaemia in psoriasis to prevent atherosclerosis and its complications.

Though, the study had a small sample size. However it may form a base for a larger future study.

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