

Lipid Profile in Patients with Psoriasis Attending Khartoum Teaching Hospital for Dermatology and Venereal diseases

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Abstract

Background: Psoriasis is an inflammatory dermatosis that is characterized with hyperproliferation of keratinocytes and inflammatory infiltration in the epidermis and dermis. The high prevalence of atherosclerosis has been reported in psoriatic patients. High serum lipid level has been suggested in the pathogenesis of this phenomenon. **Aims:** To compare the lipid profile values of psoriatic patients with those of age and sex-matched non-psoriatic controls. **Materials and Methods:** the study involved a control group of apparently healthy non-psoriatic as controls (N = 80) matched for age with a test group of psoriatic patients (N = 80). The age range of both groups was 18-65 years. Serum total cholesterol (TC), triglycerides (TG), HDL-Cholesterol (HDL-C), and LDL-cholesterol (LDL-C), concentrations were measured according to the standards. Appropriate statistical tests were used to assess significant difference in the means of the studied concentrations between patients and the control group. **Results:** The psoriatic patients showed significantly higher TC (M±SD = 225±35 mg/dl), TG (M±SD = 170.9±25 mg/dl), LDL-C (M±SD = 160.3±40 mg/dl) levels compared to non-psoriatic (M±SD = 126±32 mg/dl, 101.8±22 mg/dl, 105±33 mg/dl, respectively, P < 0.05). In contrast, HDL concentrations were less in patients (M±SD = 38.11±11 mg/dl) compared with the control group (M±SD = 51.41±15 mg/dl, P = 0.02). **Conclusion:** This study shows that high serum lipid level is significantly more common in psoriasis. It may be useful to do early screening and treatment of hyperlipidemia in psoriasis to prevent the atherosclerosis and its complications.

Key words: Psoriasis, Sudanese, Lipids, CVD

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Introduction

Psoriasis is an autoimmune chronic inflammatory disease of the skin⁽¹⁾, scalp, nails, and sometimes joints⁽²⁾, that affects 1-2 percent of the general population⁽³⁾. Psoriasis typically first affects patients between the ages of 15 and 35 and can cause major physical and psychological morbidity, leading to a significant economic burden on the health care system and the patient⁽⁴⁻⁶⁾. Psoriasis was originally thought to be an inflammatory disorder solely affecting the skin, but it is now recognized as a systemic inflammatory disease, much like systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA)⁽⁵⁾. Research suggests that patients with chronic systemic inflammatory diseases like SLE, RA, and psoriasis are at increased risk for atherosclerosis and heart disease⁽⁷⁻⁹⁾. With new evidence supporting the inflammatory basis for atherosclerosis and coronary artery disease (CAD), researchers hypothesize that systemic inflammation may be one potential mechanism linking chronic inflammatory diseases to atherosclerosis and heart disease⁽¹⁰⁾. Not surprisingly then, recent observational studies show an increased risk of cardiovascular disease in patients with psoriasis^(11;12). Psoriasis has been associated with an abnormal plasma lipid metabolism and diabetes possibly related to alterations in insulin secretion and sensitivity⁽¹³⁾. There is also increased oxidative stress with high frequency of cardiovascular events. High prevalence of cardiovascular events is related to severity of psoriasis⁽¹⁴⁾.

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

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

Patients and Methods

During the period from April 2012 to April 2013 at Khartoum Teaching Hospital for Dermatology and Venereal Diseases-Khartoum-Sudan, a total of 80 (45 male and 35 female) patients with psoriasis were selected and included in the study. Similar number of non-psoriatic patients i.e. 44 male and 36 female with matching ages were included as controls. All patients age was more than 18 years of either gender and with various grades of severity were included in study. The study was approved by Alneelain University Ethics Committee and all subjects gave informed consent (Based on Helsinki Declaration), the informed consent was signed by them. Patient's information's were collected by a structured questionnaire. The control subjects group was taken from healthy

volunteers and workers in the hospital. The patients were divided into three groups according to rule of nine to determine this percentage of severity, 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. Only patients with mild disease (< 30% body involvement) were included in study, that is to avoid patients with systemic involvement.

Patients with conditions which may affect lipids metabolism were excluded such as patients with history of alcohol intake, smoking, hypertension, diabetes, BMI > 30kg/m² or with personal or family history of metabolic disease, patients taking drugs known to affect lipid or carbohydrate metabolism were also excluded.

Venous blood (5 ml) of was drawn in sterile syringe, after standard fasting, for estimation of total cholesterol (TC), low and high density lipoprotein cholesterol (LDL-C and HDL-C), and serum triglyceride (TG) levels. These tests were done on BioSystems A25 chemistry analyzer (Barcelona-Spain).

Statistical Analysis: Statistical evaluation was performed using the Microsoft Office Excel (Microsoft Office Excel for windows; 2007) and SPSS (SPSS for windows version 19). Normal distribution of the studied variables was examined using Kolmogorov-Smirnova and Shapiro-Wilk tests. Unpaired T-test and Mann-Whitney U test were used to assess significant difference in the means of the studied variables in patients and control.

Results

The study included a total of 160 participants. Among them 80 had psoriasis (45 male and 35 female) and 80 were healthy controls (40 male and 40 female). Their ages ranged from 18 to 65 years ($M \pm SD = 46.9 \pm 12.2$ years). All had psoriatic lesions that involved less than 30% of body surface. The duration of disease ranged between 18 months to 15 years ($M \pm SD = 7.0 \pm 1.8$ years).

The laboratory data indicated that psoriatic patients group had higher serum lipids ($M \pm SD$, TC= 225±35, TG= 170.9±25, and LDL-C=160.3±40) concentrations compared with control (TC= 126±32, TG= 101.8±22, and LDL-C=105±33) ($P = <0.05$, Table.1).

The concentration of HDL-C was significantly lower in patients ($M \pm SD$, 38.11±11) compared with control ($M \pm SD = 51.41 \pm 15$) ($P = 0.02$).

Statistical significant differences were observed in patients with psoriasis according to gender. Females have higher TG ($M \pm SD = 197 \pm 40$) compared to males ($M \pm SD = 118 \pm 34$, $P = 0.001$), while TC and LDL-C were higher in male ($M \pm SD = 228 \pm 50$ for TC, and 166 ± 45 for LDL-C) compared to female ($M \pm SD = 176 \pm 58$ for TC, and 123 ± 25 for LDL-C), ($P = 0.001$, and 0.012 , respectively). HDL-C was higher in female compared to male ($M \pm SD = 62 \pm 22$ for female, and 43.8 ± 12 for male, $P = 0.001$), as shown in table 2.

Table-1: Lipid profile in patients and control

Parameter	Group (n=160)		P.value
	Patient (n = 80) Mean \pm SD	Control (n = 80) Mean \pm SD	
T.cholesterol (mg/dl)	225 \pm 35	126 \pm 32	< 0.001
LDL (mg/dl)	160.3 \pm 40	105 \pm 33	< 0.001
TG (mg/dl)	170.9 \pm 25	101.8 \pm 22	< 0.001
HDL (mg/dl)	38.11 \pm 11	51.4 \pm 15	0.02

Table-2: Lipid profile in psoriatic patients according to gender

Parameter	Group (n=80)		P.value
	Male (n = 45) Mean \pm SD	Female (n = 35) Mean \pm SD	
T.cholesterol (mg/dl)	228 \pm 50	176 \pm 58	0.001
LDL (mg/dl)	166 \pm 45	123 \pm 25	0.012
TG (mg/dl)	118 \pm 34	197 \pm 40	0.001
HDL (mg/dl)	43.8 \pm 12	62 \pm 22	0.001

Discussion

There has been much interest in determining lipid abnormalities and other risk factors for atherosclerosis in psoriatic patients. Lea WA et al., (1958) were the first who reported abnormal serum lipids in patients with psoriasis more than 50 years ago⁽¹⁵⁾. After that many studies have been done on this subject which were consistently reported a raised prevalence of lipid abnormalities in psoriasis^(7;16).

There is increased prevalence of coronary artery disease in patients with abnormal lipids metabolism^(17;18). The predisposition to vascular occlusive events in psoriasis has increased possibly because of raised plasma lipids and other inflammatory mediators⁽¹⁰⁾.

The reported evidence linking psoriasis with CV risk factors and adverse cardiac outcomes, initiated the development of additional screening guidelines in patients with psoriasis⁽¹⁹⁾.

The finding of this study is in accordance with what had been previously reported, although there are controversial reported results^(20;21), but the majority of them reported results confirms hyperlipidemia in psoriatic patients^(6;8;11;22).

The present study indicated that serum TC levels were significantly higher in patients with psoriasis compared to healthy individuals ($P= 0.001$); this is in agreement with many studies^(23;24).

Serum level of LDL-C levels in psoriasis patients have also been reported to be high, or normal in various studies⁽²⁵⁾. But in this study serum LDL-C was significantly higher in patients. LDL-C is the type of lipoproteins which directly associated with atherosclerosis⁽²⁶⁾.

A similar controversy (low, normal, and high results) also exists regarding levels of serum TG⁽²¹⁾. There was a significant difference TG levels between the two groups in our study, patients have higher levels.

Previously it was reported that patients with psoriasis had significantly decreased HDL-C concentrations⁽¹³⁾, this is in consistence with our findings, so psoriatic patients are at risk for developing CVD due to low levels of good cholesterol⁽²⁷⁾.

In the present 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. Gender differences in lipids profile was studied earlier and it reported higher serum lipids in male compared to female⁽²⁸⁾, and it was reported that hormonal changes which occur during posmenopause increases risk of cardiovascular disease due to impaired

lipids metabolism⁽²⁹⁾.

The reasons for dyslipidemia in psoriasis can be explained by changes that occurs in structure and functions of digestive system⁽³⁰⁾, changes in some immune components like interleukins, and raise in acute phase proteins due to inflammations⁽³¹⁾.

The limitations of this study include the small sample size used, in addition, temporary changes in lipids due to acute illness are possible, and we were unable to exclude such lipid measurements from our analyses. However, acute illness is relatively rare; therefore, this issue should have little impact on or results.

Conclusion

This study shows an increased prevalence of lipid abnormalities in Sudanese with psoriasis. Hence, is recommended early screening and treatment of hyperlipidemia in patients to prevent atherosclerosis and its complications.

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