Amer et al., Gynecol Obstet (Sunnyvale) 2015, 5:12
http://dx.doi.org/10.4172/2161-0932.1000346

Gynecology & Obstetrics

Research Article Open Access

# Psoriasis Severity is Affected by T the Lipid Profile in Egyptian Patients

**Mohamed Amer, Ahmed Galal and Amin Amer***

*Department of Dermatology and Venereology, Medical School, Zagazig University, Egypt*

## Abstract

**Background:** Psoriasis is a very common, chronic inflammatory and proliferative skin disease with different clinical forms that can affect males and females.In recent years psoriasis has been linked lately to different systemic disease associated with numerous multi-organ abnormalities and complications.Psoriasis is related to elevated cholesterol levels and triglycerides levels and this will be important in the management of it.So their is a great need to study lipid abnormalities in psoriatic patients, which will help us to evaluate the level of risk individuals for developing atherosclerosis and vascular obstructive disorders, as well as associated morbidity and mortality.

**Methods:** Fifty Patients (27 male and 23 female) with different types and severity of psoriasis, 50 persons (28 male and 22 female) as controls. Serum total cholesterol (TC) High density lipoprotein, Low density lipoprotein (LDL), Triglycerides (TG). Serum total cholesterol, triglyceride and HDL-C were measured by using Spin react kit.

**Results**: Serum lipid profile levels in the psoriasis group shows that the range of serum cholesterol level was 132 to 307 with a mean of (201 ± 33, 4) mg%. The range of serum low density lipoprotein cholesterol (LDL-C) was 87 to 254 with a mean of (138 ± 33.4) mg%. The range of triglyceride was 60 to 236 with a mean of (149.7 ± 36) mg%. The range of serum high density lipoprotein cholesterol (HDL-C) was 21 to 44 with a mean of (31.5 ± 5) mg%.

**Conclusion:** The results of this study conclude that cholesterol, LDL and triglyceride levels were previously reported to be higher in psoriasis patients while HDL levels were previously reported to be low which makes a difference in the severity of psoriasis.

**Keywords:** Psoriasis; Lipids; LDL; HDL; Triglycerides

## Introduction

Psoriasis is a common, chronic, inflammatory, and proliferative skin disease characterized by increased T helper cell activity and associated with abnormal lipid metabolism [1].

According to world psoriasis day consortium about 125 million people all over the world suffer from this disease, however, in some countries there is a higher prevalence rate of psoriasis, as in Kazakhstan, Trinidad and Tobago, Paraguay, Kenya, Tanzania, Egypt, and Kuwait [2].

Increased risk of cardiovascular abnormalities, hypertension, dyslipidemia, atherosclerosis, diabetes mellitus type 2, obesity, chronic, cerebral stroke, osteoporosis, cancer, and depression was noticed in psoriatic patients [3].

Psoriasis vulgaris has not only been associated with several comorbidities like metabolic syndrome and cardiovascular disease, but also with neurologic disorders like multiple sclerosis (MS).

We measured the serum total cholesterol, triglyceride, high density lipoprotein (HDL), and low density lipoprotein (LDL) levels in patients with psoriasis and compared these levels with those from healthy controls and if it affects the severity of psoriasis.

## Patients and Methods

This cross sectional observational controlled study was carried out at the outpatient clinics of Dermatology and Venereology Department, Faculty of Medicine, Zagazig University during the period from January 2012 till October 2012. This study included 100 participants:

Fifty Patients (27 male and 23 female) with different types and severity of psoriasis, 50 persons (28 male and 22 female) as controls. All participants were subjected to

### Detailed history taking

• Personal history, including the name, age, occupation, residence, special habits as smoking.

• Family history of common diseases or similar condition.

• Past history of diseases as hypertension, diabetes and drugs either systemic or local

• Onset, course, duration, site and treatment of psoriasis (for psoriasis patients)

### Complete general examination

**Clinical assessment of the severity and distribution of psoriasis:** Control group was taken from healthy paramedical staff and volunteers. The clinical severity was determined using rules of nine and Severity Index (PASI) score.

### Inclusion criteria

Patients with all clinical forms of psoriasis such as plaque, hyperkeratotic, palmoplantar, nail, scalp and flexural psoriasis, ages range from 15 to 60 years.

***Corresponding author:** Amin Amer, Department of Dermatology and Venereology, Medical school, Zagazig University, Cairo, Egypt, Tel: +201000040040; E-mail: aminamer74@gmail.com

**Received** November 18, 2015; **Accepted** December 03, 2015; **Published** December 30, 2015

**Citation:** Amer M, Galal A, Amer A (2015) Psoriasis Severity is Affected by T the Lipid Profile in Egyptian Patients. Gynecol Obstet (Sunnyvale) 5: 346. doi:10.4172/2161-0932.1000346

### Exclusion criteria

1. Erythrodermic and pustular forms because of systemic involvement in these forms, hypertension, diabetes, BMI > than 30, 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, pregnant females patients or those taking oral contraceptive for at least 6 months, Women in their menopausal stage.

2. Patients receiving systemic cardiovascular treatment or immunocompressive therapy.

A 5 ml of venous blood was drawn into a sterile syringe(After fasting for 8 hours), and submitted to the laboratory for centrifugation and isolation of blood serum and kept at -20°C until the test day.

### Lipid profile was included

Serum total cholesterol (TC), High density lipoprotein, Low density lipoprotein (LDL), Triglycerides (TG). Serum total cholesterol, triglyceride and HDL-C were measured by using the Spin react kit (made in Spain).

LDL-C was calculated according to the following formulae: VLDL-C=Triglyceride/5. LDL-C=Total cholesterol-(VLDL-C + HDL-C).

After the data collection, it was analyzed by statistical package of SPSS-19 and the following tests were used: Chi–square (X2), student t-test, paired samples t-test, one way ANOVA.

## Result

This study included a total of 100 participants, Case group included 50 patients; 27 males (54%) and 23 females (46%). Their ages ranged from 16 to 60 years with a mean of 36.5 ± 13.5 years.

Control group included 50 individuals; 28 males (56%) and 22 females (44%) their ages ranged from 17 to 60 years with a mean of 34.5 ± 12.18 years and there was no significant difference in sex between the psoriasis and control groups (p= 0.84).

Serum lipid profile levels in the psoriasis group shows that the range of serum cholesterol level was 132 to 307 with a mean of (201 ± 33, 4) mg%. The range of serum low density lipoprotein cholesterol (LDL-C) was 87 to 254 with a mean of (138 ± 33.4) mg%. The range of triglyceride was 60 to 236 with a mean of (149.7 ± 36) mg%. The range of serum high density lipoprotein cholesterol (HDL-C) was 21 to 44 with a mean of (31.5 ± 5) mg% as shown in (Table 1).

In the control group the range of serum cholesterol level was 150 to 198 with a mean of (169 ± 13) mg%. The range of serum low density lipoprotein cholesterol (LDL-C) was 83 to 143 with a mean of (108 ± 14.9) mg%. The range of triglyceride was 67 to 150 with a mean of (103 ± 21) mg%. The range of serum high density lipoprotein cholesterol (HDL-C) was 36 to 48 with a mean of (41 ± 3.1) mg% (table 1).

The mean Cholesterol, LDL cholesterol, and triglycerides levels were elevated and the mean HDL cholesterol levels were reduced in both patients and control groups and the differences were highly significant (P<.001) (Table 1).

One way variance analysis test (one way ANOVA) showed that there was a relation between cholesterol level in a case group and degree of disease intensity (P=0.00). Furthermore, a similar result was achieved for HDL (P=0.01) and LDL-C (P=0.02) while there was no significant relation between disease intensity and triglyceride was proved (P=0.32) as shown in (Table 2).

## Discussion

Psoriasis is a chronic inflammatory skin disease Characterized by increased T helper-1 and T helper-17 cells activity [1]. Complex network of cytokines and chemokines mediate the pathological reaction, whereas the abnormal function of psoriatic regulatory T cells is likely responsible for the chronic nature of psoriasis [4].

A number of conflicting findings have been reported about the various parameters and lipid profiles studied among psoriatic patients, with some studies reporting high levels, and some reporting normal levels across a number of the same measures.

We found significantly higher levels of total cholesterol, triglycerides and LDL-cholesterol while decreased HDL-cholesterol levels in patients of psoriasis compared to controls and there was a highly significant difference in the levels between the two groups (p<0.001).

Considering the intensity of the disease in the case group, there was observed higher serum cholesterol level parallel with disease intensity. LDL-C and HDL-C level was increased respectively (p=0.002) and (p=0.01). There was no relation between serum TG level and disease intensity (P=0.32).

The results of this study match with previous studies, where cholesterol, LDL and triglyceride levels were previously reported to be higher in psoriasis patients while HDL levels were previously reported to be low [5].

There may be several mechanisms for the increased lipid levels in psoriasis. Psoriasis is a chronic inflammatory state characterized by an increase in the immunological activity of helper T cells and chronic inflammation has been suggested as a part of the metabolic syndrome. Both psoriasis and the metabolic syndrome are characterized by increases in the immunological activity of helper T cells [6].

Chronic systemic inflammation induces endothelial dysfunction, altered glucose metabolism, and insulin resistance that plays a significant role in the development of obesity, diabetes mellitus, dyslipidemia, and cardiovascular disease such as atherosclerosis and myocardial infarction or stroke [7].

Cytokines such as TNF-α and IL-6 seem to play a central role. TNF-α plays a critical role in the activation of innate and acquired immune responses leading to chronic inflammation, tissue damage and keratinocyte proliferation. TNF-α levels are markedly increased in

| Parameters (mg/dl) mean ± SD | Cases | Control | T | P |
|---|---|---|---|---|
| Cholesterol | 201 ± 33.4 | 169.3 ± 13 | 6.23 | <.001** |
| Triglycerides | 149 ± 36 | 103 ± 2 | 7.8 | <.001** |
| HDL | 31.5 ± 5 | 36 -48 | 11.38 | <.001** |
| LDL | 87 - 254 | 83 to 143 | 5.74 | <.001** |
| ** Highly significant. | | | | |

**Table 1:** Comparison of lipid profile in psoriasis and control groups.

| Parameters (mg/dl) | Mild (n=21) | Moderate (n=23) | Severe (n=6) | F | P |
|---|---|---|---|---|---|
| Cholesterol | 185.5 ± 2 | 202.6 ± 31.6 | 246 ± 32 | 12.766 | .000** |
| Triglycerides | 142 ± 39 | 152.5 ± 35 | 166 ± 19.9 | 1.164 | .321 |
| HDL | 33.5 ± 4.9 | 30.8 ± 4.7 | 27 ± 2.6 | 5.059 | .010** |
| LDL | 123 ± 21.6 | 142.6 ± 28.6 | 172.6 ± 54.5 | 6.850 | .002** |
| ** Highly significant. | | | | | |

**Table 2:** Comparison between lipid levels and severity of disease.

skin lesions, synovium and serum of patients with psoriasis and these correlate with the severity of the disease. Decreased levels are associated with clinical resolution [8].

Furthermore, interleukin-6, IL-8, Interferon -γ, IL1, and IL-17 are also implicated in the generation of pro-atheromatous abnormalities like dyslipidaemia, insulin resistance, endothelial dysfunction, the clotting system activation, and pro-oxidative stress. TNF-α may affect endothelial dysfunction by decreasing the levels of nitric oxide synthetase and cyclooxygenase-1[9].

Antipsoriatic drugs such as oral retinoids and cyclosporine can be also responsible for lipid profile disturbances in psoriatic patients because of their action on the circulating lipids. Including hypercholesterolemia, hypertriglyceridaemia and low HDL-cholesterol [10].

Recently it has been shown that infliximab, which is used to treat patients with psoriatic arthritis, can also increase triglyceride levels in psoriatic patients [11].

Both psoriasis and dyslipidemia are risk factors for cardiovascular disease and it is important to predict the risk of cardiovascular disease in patients with psoriasis. Psoriasis has also been shown to be an independent risk factor for cardiovascular mortality [12].

In addition, there appears to be a significant association between psoriasis and traditional risk factors for atherosclerosis and heart disease in the general population, such as diabetes mellitus type II, coronary artery disease, peripheral vascular disease and hypertensive heart disease [12,13].

## Recommendations

It is important to measure serum lipid level particularly cholesterol, LDL and TG in psoriatic patients for early screening of hyperlipidaemia to evaluate risk to atherosclerosis and vascular obstructive disorders and its complications. Further research is needed to assess the impact of traditional cardiovascular risk factors, comorbidities, psoriasis disease severity, and the choice of lipid-lowering therapy on the lipids in patients with psoriasis. Administrating lipid-lowering medicines for patients particularly cases with severe disease may be beneficial in prognosis especially that hyperlipidemia is relatively easy to treat.

Lifestyle modifications like diet low in fat and physical exercise, prevention of smoking must be advised to patients to prevent cardiovascular disease.

## References

1. Pietrzak A, Michalak-Stoma A, Chodorowska G, Szepietowski JC (2010) Lipid disturbances in psoriasis: an update. Mediators Inflamm 2010.
2. Chandran V, Raychaudhuri SP (2010) Geoepidemiology and environmental factors of psoriasis and psoriatic arthritis. J Autoimmun 34: J314-321.
3. Nijsten T, Wakkee M (2009) Complexity of the association between psoriasis and comorbidities. J Invest Dermatol 129: 1601-1603.
4. Gyulai R, Kemény L (2006) [The immunology of psoriasis: from basic research to the bedside]. Orv Hetil 147: 2213-2220.
5. Tekin NS, Tekin IO, Barut F, Sipahi EY (2007) Accumulation of oxidized low-density lipoprotein in psoriatic skin and changes of plasma lipid levels in psoriatic patients. Mediators Inflamm.
6. Langley RG, Krueger GG, Griffiths CE (2005) Psoriasis: epidemiology, clinical features, and quality of life. Ann Rheum Dis 64 Suppl 2: ii18-23.
7. Boehncke WH, Boehncke S, Tobin AM, Kirby B (2011) The 'psoriatic march': a concept of how severe psoriasis may drive cardiovascular comorbidity. Exp Dermatol 20: 303-307.
8. Joshi R (2004) Immunopathogenesis of psoriasis. Indian J Dermatol Venereol Leprol 70: 10-12.
9. Karadag AS, Yavuz B, Ertugrul DT, Akin KO, Yalcin AA, et al. (2010) Is psoriasis a pre-atherosclerotic disease? Increased insulin resistance and impaired endothelial function in patients with psoriasis. Int J Dermatol 49: 642-646.
10. Wakkee M (2010) Psoriasis: comorbidity and treatment. Rotterdam, The Netherlands: Erasmus University Rotterdam.
11. Castro KR, Aikawa NE, Saad CG, Moraes JC, Medeiros AC, et al. (2011) Infliximab induces increase in triglyceride levels in psoriatic arthritis patients. Clin Dev Immunol 2011: 352686.
12. Gelfand JM, Mehta NN, Langan SM (2011) Psoriasis and cardiovascular risk: strength in numbers, part II. J Invest Dermatol 131: 1007-1010.
13. Gkalpakiotis S, Arenberger P, Gkalpakioti P, Meluzinova E, Chandran D, et al. (2014) Management of psoriasis vulgaris and multiple sclerosis with fumaric acid. J Am Acad Dermatol 70: e60-61.

**Citation:** Amer M, Galal A, Amer A (2015) Psoriasis Severity is Affected by T the Lipid Profile in Egyptian Patients. Gynecol Obstet (Sunnyvale) 5: 346. doi:10.4172/2161-0932.1000346