

# Serum level of Visfatin in Psoriasis and its Relation to Disease Severity

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## ABSTRACT

**Background:** psoriasis is a chronic, debilitating, autoimmune disease that adversely affects the individual's quality of life; the disease progresses with periods of flare-ups and remission. Psoriasis affects approximately 2% of the global population. Psoriasis can begin at any age, however, the mean age of onset was 15-20 years old and the second peak period was 55-60years of age .

**Aim of the Work:** this study aimed to evaluate the serum level of visfatin in psoriatic patients and its relation to duration and severity of psoriasis.

**Subjects and Methods:** the present study represents a case-control study which was carried out on 20 patients with psoriasis vulgaris and 20 age and sex matched healthy volunteers as the controls.

**Results:** in the present study, serum level of visfatin in patients group was statistically significant higher than serum level of visfatin in the control group. There was a significant positive correlation between visfatin level and PASI score proposing visfatin as a marker of psoriasis severity.

**Conclusion:** Visfatin is one of adipokines that may have a role in the pathogenesis of psoriasis and its severity in addition to its role in the cardiovascular system diseases, which may explain the relation between psoriasis and cardiovascular complications and their severity in the psoriatic patients.

**Keywords:** Psoriasis, Visfatin, Serum, Severity, Psoriasis area severity index.

## INTRODUCTION

Psoriasis is a chronic, debilitating, autoimmune disease that adversely affects an individual's quality of life; the disease progresses with periods of flare-ups and remission. Psoriasis affects approximately 2% of the global population. Psoriasis can begin at any age, however, the mean onset age was 15-20 years old and the second peak period was 55-60years of age <sup>(1)</sup>. Psoriasis is due to a complex interplay between genetic and environmental factors. Over 40 genetic mutations have been associated with psoriasis, and among these mutations, psoriasis susceptibility locus 1 (PSORS1) and PSORS2 appear to play a major role. In addition to genetic susceptibility, environmental factors as stress, infection, trauma, or medications. Exposure to triggers in a genetically predisposed individual creates a deregulated immune response producing the characteristic lesions of psoriasis <sup>(2)</sup>.

Visfatin [also known as pre B-cell-colony-enhancing factor (PBEF)] is a 52-kDa protein mainly produced by macrophages in visceral adipose tissue <sup>(3)</sup>. Various cells of innate immunity such as neutrophils, monocytes, macrophages as well as epithelial and endothelial cells can be a source of visfatin after induction with inflammatory stimuli <sup>(4)</sup>.

The role of visfatin in psoriasis might include modulation of inflammatory or immune response as it induces chemotaxis and increases the production of IL-1<sub>β</sub>, L-6, TNF- $\alpha$  and costimulatory molecules by CD14<sup>+</sup> monocytes. This enhances their ability to induce proliferative responses <sup>(5)</sup>.

Another explanation is that visfatin level might be upregulated during inflammation and in response to inflammatory cytokines <sup>(6)</sup>.

This study aimed to investigate the role of visfatin in the pathogenesis of psoriasis and its relation to the duration, severity of the disease, and body mass index (BMI).

## SUBJECTS AND METHODS

### Subjects

The present study is a case-control study. It was carried out on 20 patients with psoriasis vulgaris and 20 age and sex matched healthy volunteers as the controls. They were enrolled from Dermatology Outpatient Clinic of Mostafa Kamel Military Hospital between the period of 1/11/2016 to 3/5/2017. All subjects gave consent to participate in this work after an explanation of the steps of the study. The study was approved by research ethical committee of

Ain Shams University and fulfilled all the ethical aspects required in human research.

**Exclusion Criteria**

- Age: <20 years and >55 years.
- Infectious conditions at the time of blood sampling.
- Lactating and pregnant women.
- Other than chronic plaque type psoriasis. eg.(pustular and erythrodermic).
- Patients currently on treatment (systemic or topical) of psoriasis.
- Other skin and/or systemic diseases.

All subjects were subjected to full history taking and clinical examination.

**II- Methods**

Patients were subjected to the following:

**1. Detailed History taking**

- Personal history: name, age, sex, occupation, residence, marital status, number of children, and special habits of medical importance.
- Menstrual and contraceptive history (for female subjects).
- Complaint and duration of illness.
- History of the present illness: onset, course, duration of illness, precipitating and relieving factors.
- History of medications: nature, route, dose, compliance, duration, effect and side effects.
- Family history.
- Past history of any associated systemic, dermatological diseases or major surgical operations.

**2. Careful Clinical Examination**

- Careful general examination to exclude any systemic diseases (including blood pressure

in 3 different occasions by palpatory and auscultatory methods).

- Dermatological examination including:
  - 1- Local clinical examination of psoriasis (confirmed by pathological examination whenever needed).
  - 2- Assessment of psoriasis severity using PASI score <sup>(7)</sup>.

**Serum sample**

Venous blood sample (3 ml) was collected after a 14-hours fast from psoriatic patients and controls, then placed directly on ice and allowed to clot for no more than 30 minutes. Sample was then centrifuged at speed of 2000 - 3000 r.p.m for 20 minutes, and serum was collected and stored at -20°C until assayed.

**The study was done after approval of ethical board of Ain Shams university and an informed written consent was taken from each participant in the study.**

**Statistical Methods**

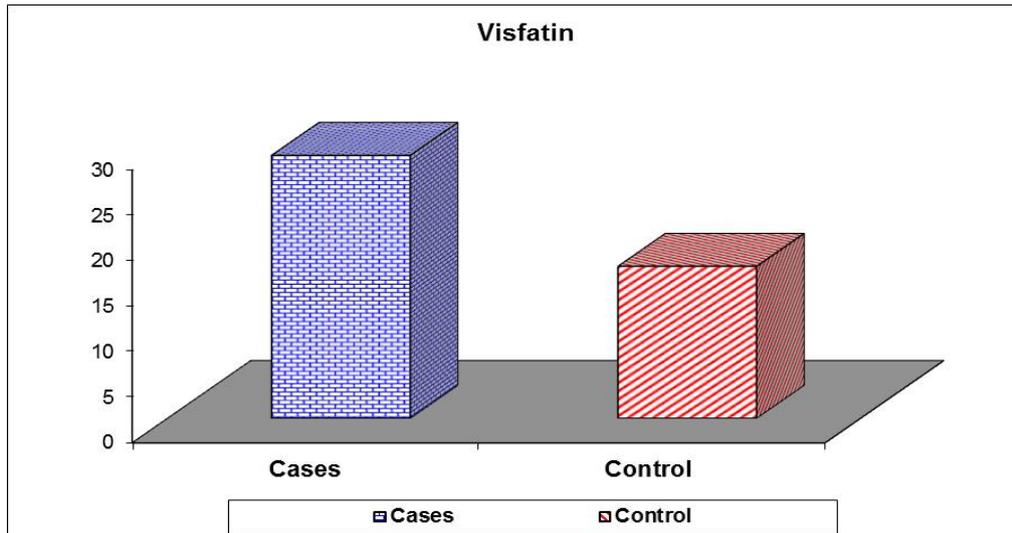
Data was collected, tabulated, then analyzed using IBM© SPSS© Statistics version 22 (IBM© Corp., Armonk, NY).

Normally distributed numerical data was presented as mean and SD, and skewed data as median and interquartile range. Qualitative data was presented as number and percentage. Comparison of normally distributed numerical data was done using the unpaired student t test. Skewed data was compared using the Mann-Whitney U test. Categorical data was compared using the chi-squared test or Fisher's exact test, when appropriate. A two-sided p-value <0.05 was considered statistically significant.

**RESULTS**

**Table 1:** showing comparison between patients and controls as regarding serum level of visfatin

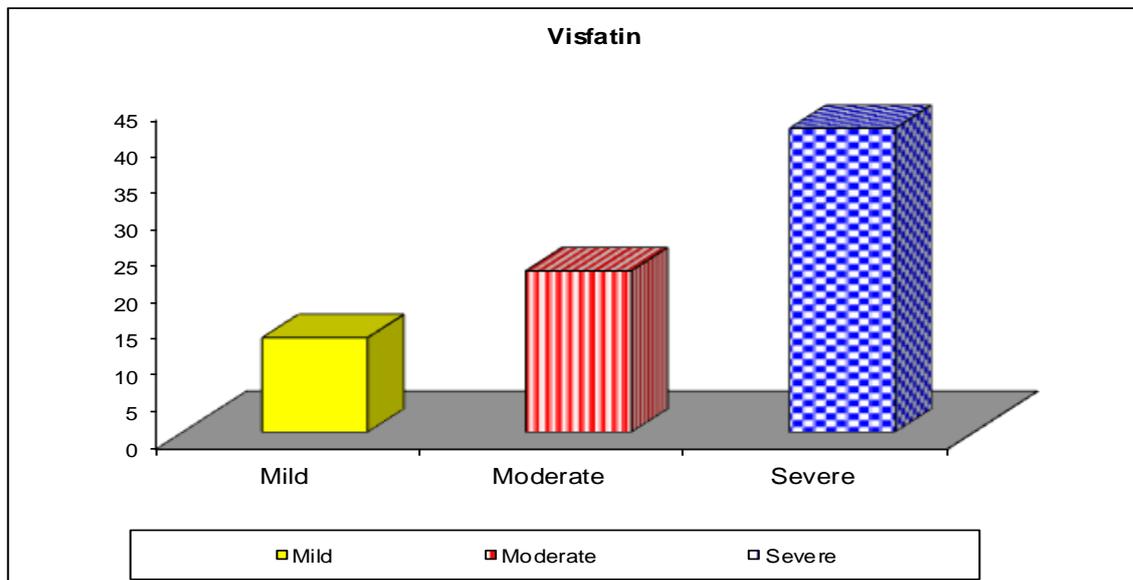
Visfatin	Cases	Control
Range	11.424 – 96.425	9.904 – 36.808
Mean ± SD	28.90± 19.47	16.77 ± 6.57
T. test	6.970	
P. value	0.012*	



**Figure 1 :** showing comparison between patients and controls as regard serum level of visfatin.

**Table 2:** showing correlation between visfatin level and disease severity

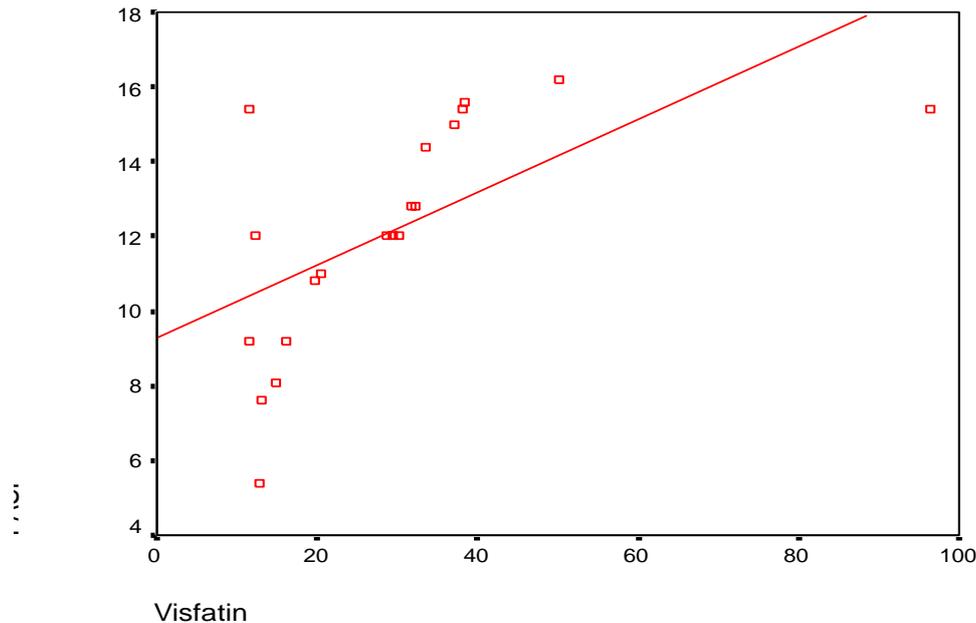
Visfatin	Mild	Moderate	Severe
<b>Range</b>	12.83 - 12.95	11.42 - 36.97	11.43 - 96.43
<b>Mean ± SD</b>	12.89 ± 0.09	22.03 ± 8.76	41.50 ± 24.67
<b>T. test</b>	3.874		
<b>P. value</b>	0.021*		



**Figure 2:** showing correlation between visfatin level and disease severity.

**Table 3:** showing correlation between visfatin level and BMI, disease duration and PASI score

	Visfatin	
	r.	p
<b>BMI</b>	0.341	0.141
<b>Duration</b>	0.418	0.066
<b>PASI</b>	0.619	0.004 *



**Figure 3:** showing correlation between visfatin level and PASI score

## DISCUSSION

Psoriasis is a chronic, debilitating, autoimmune disease that adversely affects an individual's quality of life; the disease progresses with periods of flare-ups and remission. Psoriasis affects approximately 2% of the global population. Psoriasis can begin at any age; however, the mean age of onset is 15-20 years old, and the second peak period is 55-60 years of age <sup>(1)</sup>.

Psoriasis is due to a complex interplay between genetic and environmental factors. Over 40 genetic mutations have been associated with psoriasis, and among these mutations, PSORS1 and PSORS2 appear to play a major role. In addition to genetic susceptibility, environmental factors as stress, infection, trauma or medications. Exposure to triggers in a genetically predisposed individual creates a dysregulated immune response producing the characteristic lesions of psoriasis. A deregulated immune system involving Th1 and Th17 cells drives the psoriatic inflammatory cascade <sup>(2)</sup>.

Visfatin [also known as PBEF] is a 52-kDa protein mainly produced by macrophages in visceral adipose tissue <sup>(3)</sup>. Various cells of innate immunity such as neutrophils, monocytes, macrophages as well as epithelial and endothelial cells can be a source of visfatin after induction with inflammatory stimuli <sup>(4)</sup>.

Visfatin has several pro-inflammatory and immune-modulating properties, as it promotes T-

cell activation by inducing co-stimulatory molecules such as CD80, CD40 and ICAM-1 <sup>(6)</sup>.

In the present study, Serum level of visfatin in patients group was statistically significant higher than serum level of visfatin in control group. There was no significant correlation between visfatin level and BMI or disease duration, on the other hand, there was a significant positive correlation between visfatin level and PASI score proposing visfatin as a marker of psoriasis severity.

In agreement with our study, **Ismail and Mohamed** <sup>(8)</sup> found that serum level of visfatin in patients with psoriasis was significantly higher than that of the controls. It was also significantly higher in patients with severe psoriasis than those with mild and moderate psoriasis. Also there was no statistically significant difference between normal weight, overweight and obese patients regarding serum level of visfatin, but there was a significant correlation with the duration of psoriasis.

**Yan et al.** <sup>(9)</sup> investigated the role and clinical significance of serum levels of visfatin in patients with psoriasis vulgaris and they found that the serum levels of visfatin was significantly higher than those after treatment and in normal controls, and there was a significant difference between the active stage and the rest stage of psoriasis vulgaris.

**Gerdes et al.** <sup>(5)</sup> found that serum visfatin was elevated in patients with psoriasis independent of other factors such as BMI and waist circumference. Regarding the BMI, it was clear that

there was no statistically significant difference between the two groups. Moreover, There was no correlation between BMI and PASI score. There was also no correlation between BMI and the duration of psoriasis.

In agreement with this study, **Ilkin *et al.*** <sup>(10)</sup> did not find that BMI and waist circumference significantly higher in psoriasis patients. However they observed a higher prevalence of metabolic syndrome among psoriatic patients than controls. This may be explained by the literature which concluded that the association between psoriasis and metabolic syndrome is independent from the tendency of psoriatic patients to be obese.

On the contrary, **Katarina *et al.*** <sup>(11)</sup> observed that one unit increment in BMI was statistically significantly associated with a 7% higher risk of increased psoriasis activity measured by PASI score at the onset of psoriasis ,explaining that excessive adipose tissue in obese patients produces pro-inflammatory cytokines such as TNF- $\alpha$  which is involved in psoriasis.

Visfatin has been proposed as a marker of endothelial dysfunction, an initial and crucial step in the progression of the atherosclerotic process <sup>(12)</sup>.

In morbid obese patients, epicardial fat thickness as assessed by echocardiography was related to enhanced visfatin visceral obesity <sup>(13)</sup>.

Visfatin could provide a link between psoriasis and CV morbidity as it was shown to be upregulated in atherosclerotic plaques in myocardial infarction <sup>(14)</sup>.

The role of visfatin in psoriasis might include modulation of inflammatory or immune response as it induces chemotaxis and increases the production of IL-1, IL-6, TNF- $\alpha$  and costimulatory molecules by CD14+ monocytes. This enhances their ability to induce proliferative responses <sup>(5)</sup>.

Another explanation is that visfatin level might be upregulated during inflammation and in response to inflammatory cytokines <sup>(6)</sup>.

Also, as visfatin is produced by cells involved in psoriasis, raised visfatin values could be attributed to this <sup>(14)</sup>.

## CONCLUSION

Based on the results obtained in the present study we may add further evidence on the importance of assessment of serum visfatin levels and disease severity in psoriatic patients. The results of our study suggest that visfatin might play a significant role in the pathogenesis of psoriasis. Visfatin can be used as an indicator of psoriasis

activity and a possible prognostic indicator. Moreover, this study may provide important clues to assist in the development of new therapeutic strategies for patients with psoriasis.

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