

## Serum resistin level among non obese patients with psoriasis vulgaris

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### ABSTRACT

**Background:** Psoriasis is chronic, recurrent, immune mediated disease of the skin and joints. Hormonal as well as metabolic factors may play a role in the pathogenesis of psoriasis. Obesity has long been associated with and considered detrimental for psoriasis. Resistin is known as adipose tissue-specific secretory factor serving endocrine functions likely involved in insulin resistance. Serum resistin levels increase with obesity.

**Aim of the study:** The aim of this study is to clarify relation between resistin level and psoriasis severity.

**Patients and Method:** Forty patients with psoriasis vulgaris in addition to forty age matched healthy subjects as control were included. Body mass index was estimated for psoriatic and control group choosing subjects with nearly average body weight. PASI score was done for psoriatic group and serum resistin estimation was done for both group.

**Result:** Resistin level was significantly increased with increasing psoriasis severity, body mass index, duration of the disease and the age of the patients.

**Conclusion:** Resistin is interrelated factor with multi-dimensional effect concerning psoriasis severity, obesity as risk factor of psoriasis, in addition to its direct pathogenic role for psoriasis.

### INTRODUCTION

Psoriasis is chronic, recurrent, immune mediated disease of the skin and joints that may negatively affects physical, emotional, and psychosocial wellbeing of affected patients.<sup>1</sup> Psoriasis prevalence in around 1-3% of the total population.<sup>2</sup>

The etiology of psoriasis is unknown but the disease is believed to have an autoimmune basis and a strong genetic component.<sup>3</sup>

Hormonal as well as metabolic factors may play a role in the pathogenesis of psoriasis supported by early onset of psoriasis in women, with a peak around puberty, changes during pregnancy and provocation of psoriasis by high-dose estrogen therapy.<sup>4</sup>

Obesity has long been associated with and con-

sidered detrimental for psoriasis.<sup>5</sup>

Patients over ideal body-weight also tend to have worse psoriasis in terms of the proportion of involved skin. Moreover, the extent of their psoriasis lesions correlates with body mass index (BMI).<sup>6</sup>

Resistin is known as adipose tissue-specific secretory factor (ADSF) is a cystein-rich adipose-derived peptide hormone that in humans is encoded by the RETN gene.<sup>7</sup>

In primates, pigs, and dogs, resistin is secreted by immune and epithelial cells. While, in rodents, it is secreted by adipose tissue.<sup>8</sup>

Resistin was found to serve endocrine functions, and is likely involved in insulin resistance.<sup>9</sup> Serum resistin levels increase with obesity in several model systems (humans, rats, and mice).<sup>10</sup>

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Normal serum concentration of resistin in humans ranges from 7-22 ng/ml. It may also be produced also by cells other than adipocytes, which include peripheral blood mononuclear cells (PBMCs), macrophages and bone marrow cells.<sup>11,12</sup>

Resistin serum level was found to be significantly increased among obese and diabetic patients.<sup>13,14</sup> Increased resistin expression has been correlated with inflammatory markers, coronary artery disease and cardiovascular disease (CVD) in patients with the metabolic syndrome.<sup>15,16</sup>

It was found that serum resistin levels were higher in obese patients with DM2 (body mass index  $\geq 30$  kg·m<sup>-2</sup>) compared with non-diabetic obese controls.<sup>17</sup>

Emerging evidence suggests that CVD is accompanied by changes in serum resistin levels. It likewise correlated with the number of coronary vessels demonstrating >50% stenosis. Overall, serum resistin was concluded to be a strong risk factor for acute coronary syndrome (Wang *et al.*, 2009).<sup>18</sup>

The aim of this study is to investigate the relation between resistin level and psoriasis severity.

## **PATIENTS AND METHODS**

Forty patients with psoriasis vulgaris were included in this study. They were selected from the Dermatology outpatient clinic, Al-Azhar University hospitals from September 2014 to May 2015.

Also, forty age matched healthy subjects were included as controls.

### **Inclusion criteria**

Patients with psoriasis vulgaris, having average body weight, with no topical and/or systemic or

phototherapy used in at least two months prior to inclusion in this study.

### **Exclusion criteria**

Other clinical variants of psoriasis, patients severely underweight or markedly over weight, patients under treatment with systemic or topical therapy for psoriasis within the last two months, patient with chronic systemic disease (cardiac, hepatic and diabetes mellitus) and lastly, patients suffering from hyperlipidemia were also excluded.

An informed consent was obtained from all subjects enrolled in this study after explaining the aim of work and procedures applied.

### **Patient and control evaluation**

Full history was obtained from all patients as well as control subjects including personal history and family history and history of the presenting illness (psoriasis vulgaris) regarding onset, course and duration of the disease as well as associated symptoms. Medical history regarding cardiovascular symptoms, diabetes and hypertension were asked for.

### **Examination**

Height, weight, BMI, obesity, and blood pressure were estimated for both patients and controls.

Obesity was estimated according to BMI defined as the individual's body mass divided by the square of their height according to Corral *et al.*, 2006.<sup>19</sup>

- BMI of 18.5 to 25 kg/m<sup>2</sup> indicate optimal weight.
- BMI lower than 18.5 suggests the person is underweight.
- BMI above 25 may indicate the person is overweight.
- BMI above 30 suggests that the person is obese.

- BMI over 40 suggests that the person is morbidly obese. (Corral et al., 2006).<sup>19</sup>

**Dermatological examination**

Diagnosis of psoriasis was made on clinical bases. The extent and the severity of the disease were assessed using Psoriasis Area and Severity Index (PASI) score and calculation was done according to Feldman and Kruger 2005.<sup>20</sup>

**Serum collection and resistin level estimation**

Peripheral venous blood samples were collected from forty patients and forty control subjects from a serum separator tube and samples allowed to clot for 30 minutes before centrifugation for 15 minutes at 1000 x g and then stored at ≤ -20 °C.

Serum resistin was measured using ELISA kit supplied by eBioscience, an affymetrix company, USA.

**Statistical methods**

The data was analyzed using Microsoft Excel 2010 and statistical package SPSS version 18.0 for windows (SPSS Inc., Chicago, IL).

**RESULTS**

The present study included 80 subjects, group 1 included 40 patients who were non obese pa-

tients with psoriasis vulgaris, while group 2 included 40 healthy subject as a control.

Regarding control group, there were 18 males (45%) and 22 females (55%), their age ranged between (17-57) years with mean ± SD (34.3±10.57). While, in psoriasis patients there were 21 males (52.5%) and 19 females (47.5%). Their age ranged between (22-60) years with mean ± SD (43.4±11.37).

BMI of control patients, ranged between (19.5-27.68) kg/m<sup>2</sup> with mean ± SD (23.94±1.88), while in psoriasis patients it ranged between (19.5-29.70) kg/m<sup>2</sup> with mean ± SD (26.17±3.03) with statistically significant difference between control and psoriasis patients.

The resistin level of control patients, ranged between (2–27) ng/ml with mean ± SD

**Table 1** Gender distribution of psoriasis patients according to PASI score

PASI Score	Sex	Frequency	Percent
Mild	Female	1	25.0
	Male	3	75.0
	Total	4	100.0
Moderate or Sever	Female	18	50.0
	Male	18	50.0
	Total	36	100.0

**Table 2** BMI of patients according to gender

BMI of patients according to gender							
Group	Sex	N	Minimum	Maximum	Mean	SD	P-Value
Control	Female	22	19.92	26.80	23.99	1.73	0.94
	Male	18	19.50	27.68	23.88	2.1	
	Total	40	19.50	27.68	23.94	1.88	
Psoriasis	Female	19	19.50	29.70	26.14	3.31	0.78
	Male	21	19.92	29.70	26.2	2.82	
	Total	40	19.50	29.70	26.17	3.03	

On the other hand, BMI showed significant increasing with more psoriasis severity according to PASI score

**Table 3** BMI of psoriasis patients according to PASI Score

BMI of psoriasis patients according to PASI Score						
PASI Score	N	Minimum	Maximum	Mean	SD	P-Value
Mild	4	19.92	25.40	23.08	2.72	0.03*
Mod. or severe	36	19.50	29.70	26.51	2.88	

**Table 4** Resistin of patients according to sex

Resistin of patients according to sex							
Group	Sex	N	Minimum	Maximum	Mean	SD	P-Value
Control	Female	22	2.00	27.00	11.77	6.45	0.82
	Male	18	6.00	27.00	13.22	6.29	
	Total	40	2.00	27.00	12.42	6.34	
Psoriasis	Female	19	22.00	57.00	41.1	13.25	0.83
	Male	21	18.00	58.00	40.57	13.48	
	Total	40	18.00	58.00	40.82	13.2	

**Table 5** Resistin level of psoriasis patients according to PASI Score

Resistin level of psoriasis patients according to PASI Score						
PASI Score	N	Minimum	Maximum	Mean	SD	P-Value
Mild	4	18.00	29.00	25.25	4.99	0.01*
Mod. or severe	36	22.00	58.00	42.56	12.69	

Resistin serum level showed significant positive correlation with age, duration of psoriasis, PASI score as well as BMI.

**Table 6** Correlation study of resistin with different variables

Correlation items		r	p-value
Resistin	Age	0.334**	0.002
	Duration	0.803**	0.000
	PASI score	0.918**	0.000
	BMI	0.765**	0.000

(12.42±6.34). While, in psoriasis patients it ranged between (18- 58) ng/ml with mean ±SD (40.82±13.2) with significant higher resistin level among psoriatic patient compared to control group. (P-value<0.001).

When comparing resistin level between mild and moderate to severe psoriasis, it was significantly higher with increasing PASI score.

## DISCUSSION

Psoriasis is a chronic disease that affects 1-3% of the population.<sup>2</sup>

The etiology of psoriasis is unknown but the disease is believed to have an autoimmune basis and a strong genetic component.<sup>3</sup>

Obesity has long been associated with and considered detrimental for psoriasis. As patients with higher than ideal bodyweight tend to have worse psoriasis, and the extent of their psoriasis lesions correlates with body mass index (BMI).<sup>5,6</sup> Resistin a product of the RSTN gene, is a peptide hormone belonging to the class of cysteine-rich secreted proteins.<sup>7</sup>

Resistin may be an important link between obe-

sity and insulin resistance.<sup>9</sup>

In the current study, estimation of serum levels of resistin in a sample of Egyptian psoriatic patients and controls revealed a significant increase of serum level of resistin among psoriasis patients than in controls and correlated with the disease parameters including PASI, age, disease duration and BMI measured in the present work. These data support the view that resistin may be involved in the pathogenesis of psoriasis, possibly by augmenting the cytokine expression by the inflammatory infiltrate.

Resistin has been shown to be associated with the overexpression of proinflammatory cytokines responsible for progression of rheumatoid arthritis such as interleukin (IL)-6 and tumor necrosis factor (TNF)- $\alpha$ , and IL-1 $\beta$ .<sup>21, 22</sup>

Likewise, increased resistin expression has been correlated with inflammatory markers, coronary artery disease and cardiovascular disease (CVD) in patients with the metabolic syndrome (MetS).<sup>15, 16</sup>

It was found that resistin, causes endothelial progenitor cells (EPC) homing and VEGF-dependent tube formation with subsequent angiogenesis.<sup>22</sup>

Similar findings were found by Arnadottir et al, 2009 who found serum resistin is elevated in psoriasis and correlated with disease severity through inducing pro-inflammatory cytokine production by monocytes.<sup>23</sup>

Huang et al,<sup>1</sup> also concluded that elevated serum resistin levels strongly correlate with psoriasis progression and serum resistin level could be a valuable biomarker in evaluating the clinical status of psoriasis patients.<sup>24</sup>

Moreover, Hamminga showed that resistin plays a predominant role in the pathogenesis of psoria-

sis, particularly in obese patients that is in concordance with the results of present study.<sup>25</sup>

Several mechanisms have been proposed to explain why psoriasis might lead to obesity, including decreased physical activity, increased social isolation, depression, unhealthy dietary habits. Which is also evidence, indicating that obesity may predispose patients to the development of psoriasis.<sup>5</sup>

In our study, resistin level correlated positively with all parameters associated with increased psoriasis severity such as BMI, age of the patients, duration of the disease and the PASI score. Resistin seems to be having multidimensional effect on interrelated different conditions so it is probable future target for treating such diseases.

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