Study of Omentin 1, in patients with psoriasis and its relation to disease severity (Systematic review)

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Abstract: Objectives: To study the decreased serum levels of omentin-1 in patients with psoriasis compared with healthy controls, and to consider their relation to disease duration, disease severity. **Data Sources:** Medline databases (PubMed, Medscape, Science Direct. EMF-Portal) and all materials available in the Internet from 2010 to 2015. **Study Selection:** The initial search presented 5 articles of which 44 met the inclusion criteria. The articles studied the relation between mobile phones, the auditory system and genotoxicity. **Data Extraction:** If the studies did not fulfill the inclusion criteria, they were excluded. Study quality assessment included whether ethical approval was gained, eligibility criteria specified, appropriate controls, adequate information and defined assessment measures. **Data Synthesis:** Comparisons were made by structured review with the results tabulated. **Findings:** Omentin 1 levels were significantly lower in psoriasis cases compared with healthy controls in 4 of the studied publications. These four studies reported relation between Omentin 1 and the clinical severity of psoriasis. **Conclusion:** Our study concludes that Omentin1 is significantly lower in psoriatic patients than healthy population. Low levels of circulating omentin1 are also associated with the prevalence of coronary artery disease. These data suggest that omentin 1 may represent a biomarker for not only metabolic disorders, but also cardiovascular diseases which ultimately leads to the cardiovascular comorbidites of psoriasis.
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1. Introduction

Psoriasis is an inflammatory skin disease characterized by hyperproliferation, modified development of the epidermis, Also aggregation of large amount of mediators of inflammation in the lesional skin ***(1).*** It is described by red sharply demarcated papules and plaques, covered with shiny white scales, usually over the extensor surfaces ***(2).*** There are two mechanisms of interactive cellular responses in the psoriatic lesion that make the balance between the activation of innate and acquired immune cell types, and the elements produced by epidermal keratinocytes that influence T cells and dendritic cells DCs, and vice versa **(3).**

Despite the fact that the accurate cause of psoriasis remains obscure, the evolving evidence suggests that psoriasis is a complex disorder initiated by the interaction of various genes, the immune system and environmental factors. **(4).**

Psoriasis is not just a skin or joint disease. Indeed, similarly to other systemic inflammatory diseases, inflammation is widespread in psoriasis. This systemic inflammation beyond the skin may provide an explanation for the increased cardiovascular risk observed not only in severe but also in mild psoriasis **(5).**

Psoriasis presents three main histological features: epidermal hyperplasia (acanthosis), dilated and prominent blood vessels in the dermis, and an inflammatory infiltrate of leukocytes, predominantly in the dermis. **(6).**

Omentin 1, a new adipokine secreted by the stromal vascular cells of visceral adipose tissue **(7).**

Multiple studies showed that Omentin1 levels were associated with a significant decrease in the number of metabolic risk factors such as increased waist circumference, dyslipidemia, high blood pressure and glucose intolerance. Plasma concentration of Omentin1 is associated with endothelium-dependent vasodilation. Circulating Omentin1 levels are negatively correlated with carotid intima-media thickness, which is a marker of early atherosclerosis. Low levels of circulating omentin 1 in patients with psoraisis are also associated with the prevalence of coronary artery disease. These data suggest that omentin1 may represent a biomarker for metabolic disorders and cardiovascular diseases (**8**).

As a routine, individuals with moderate to severe psoriasis of long duration should be recognized as

being at increased cardiovascular risk by measurement of carotid intima thickness (CIMT) and thus encouraged for therapeutic interventions to reduce the modifiable risk factors (**9**).

The aim of this study was to evaluate the serum Omentin1level in psoriasis patients and healthy subject and its correlation with duration, severity of psoriasis. Also, to evaluate the association between Omentin 1 in psoriatic patients and possible risk of cardiovascular disease in those patients.

3. Results

Study selection and characteristics:

In total 4 potentially relevant publications were identified. All of these articles were included in the review as they were deemed eligible by fulfilling the inclusion criteria. The 4 articles included in this review were human, case control studies. The studies were analyzed with respect to the study design using the classification of the U.S. Preventive Services Task Force & UK National Health Service protocol for EBM.

Omentin 1 level in psoriatic patients and controls:

All included studies showed lower levels in patients with psoriasis.

Ismail et al. (10), study included 46 psoriatic patients, as well as 42 as a control group matched for age and gender. Omentin 1 levels were significantly decreased in the psoriasis group than the control group, $P < 0.001$).

Takahashi et al. (11) study of 62 psoriatic patients, 58 healthy controls matched for age and gender. The levels of Omentin 1 were found to be significantly lower in patients with psoriasis than control group ($P< 0.05$). Figure (1).

Turan et al. (12) Omentin 1 levels were significantly lower in patients than controls**.** The serum omentin 1 levels of the patients with psoriasis were found to be significantly lower than those in the control group ($P = 0.001$). **Table (1).**

Zhang et al. (13), reported significant difference between psoriatic patients and controls regard to Omentin 1($P < 0.01$).

The Relation between decreased Omentin 1levels and clinical severity of psoriasis.

All above studies showed the inverse relation between Omentin1 and clinical severity of psoriasis.

Table (1): Clinical and demographic characteristics of the patient group and control group**:**

Table1: studies showed Omentin1 in patients with psoraisis:

Study	Type	source	Outcome
Ismail et al (10)	case control study	human	Omentin 1 is lower in psoriatic patients than controls
Takahashi et al (11)	case-control study	human	Omentin 1 is lower in psoriatic patients than controls
Turan et al. (12)	case-control study	human	Omentin 1 is lower in psoriatic patients than controls
Zhang et al (13)	case-control study.	human	Omentin 1 is lower in psoriatic patients than controls

4. Discussion

Omentin 1 levels were significantly lower in psoriatic cases compared to healthy controls in all studied articles. This may provide evidence about the role of Omentin 1 in psoriasis activity **(10, 11, 12,13)**. Within the psoriasis group, decreased Omentin1 levels were positively correlated with PASI score denoting that severe form of psoriasis is associated with lower values of Omentin 1. In agreement with our study **(10), (11), (12)** and **(13)** reported significant correlation with PASI score.

The plasma levels of Omentin1were significantly increased in treated psoriasis suggesting that Omentin1 is also a good parameter of the psoriasis treatment **(11).**

Psoriasis is an immune-mediated inflammatory skin disease characterized by epidermal hyperproliferation and impaired differentiation of keratinocytes and Omentin 1 has been reported to be associated with its pathogenesis **(13).**

Because of functional or anatomical differences between visceral and peripheral fat depots, visceral obesity is more pathogenic in promoting insulin resistance, type 2diabetes, and cardiovascular disease. Omentin1, which is selectively produced in visceral fat and is known to increase inflammation, is likely to have a more important role than other known adipokines, such as perilipin, adiponectin, and leptin in the pathogenesis of metabolic or inflammatory disease. Omentin1 activates 50AMP-activated protein kinase and endothelial nitric oxide synthase, inhibits C-reactive protein, tumor necrosis factor (TNF)-a, and NF-jB signaling pathways, reduces adhesion molecule expression, and thus has anti-inflammatory effects on smooth muscle cells and endothelium. Numerous studies have identified TNF-a and NF-jB as proteins

that regulate local complex inflammatory cascades. Therefore, these results indicate that decreased omentin-1 levels might contribute to the maintenance or promotion of the chronic inflammatory state in psoriasis and might be an important anti-inflammatory factor for prognosis **(13).**

Omentin1 levels were found to be lower in patients with psoriasis once the parameters that could affect the Omentin1 serum levels were excluded. This result has led us to consider that low Omentin1 levels might contribute to the pathogenesis of both psoriasis and accompanying cardiovascular and metabolic diseases by triggering inflammation **(10).**

Circulating Omentin1levels are negatively correlated with carotid intima-media thickness, which is a marker of early atherosclerosis. Low levels of circulating Omentin1are also associated with the prevalence of coronary artery disease. These data suggest that Omentin1may represent a biomarker for both metabolic disorders and cardiovascular diseases ***(8).***

Recent studies suggest that Omentin1may play a protective role in coronary atherosclerosis and other obesity-related cardiovascular disorders. Shang et al.18 Yoo et al. 19 reported decreased serum Omentin1level that was independently associated with arterial stiffness and carotid plaque in patients with diabetes. Therefore, decreased omentin-1 level in patients with psoriasis may be a risk factor for the high prevalence of cardiovascular disease **(18,19).**

Carotid arteries are of specific interest to investigators because they are easily accessible to non-invasive examination by high resolution B-mode ultrasonography which allows reliable, easily accessible measurement of carotid artery IMT. CIMT is widely used to evaluate premature atherosclerosis in chronic inflammatory diseases such as RA and SLE. It consider a good indicator of generalized atherosclerosis and coronary artery disease providing early inflammation on atherosclerosis in the subclinical stages of the disease in individuals at risk **(20; 21).** Follow up of psoriatic cases is mandatory to guard against cardiovascular accidents.

Conclusion:

Our study concludes that Omentin 1 is significantly decreased in patients with psoriasis as compared to the healthy population. Evaluation of the potential role of Omentin1 in the pathogenesis of psoriasis suggests that it could be a useful biomarker for disease severity. Also, decreased Omentin1 level in patients with psoriasis may be a contributing factor for the increased prevalence of cardiovascular disease.

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