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METABOLIC CHANGES AND SERUM GHRELIN LEVEL IN PATIENTS WITH PSORIASIS

Dermatology

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ABSTRACT

Background. Serum ghrelin levels may be related to metabolic and clinical changes in patients with psoriasis. Objective. This study was performed to determine the possible effects of serum ghrelin in patients with psoriasis. **Methods:** The study population consisted of 25 patients with plaque psoriasis. The patients were questioned with regard to age, gender, age of onset, duration of disease, height, weight, and bodymass index (BMI). In addition, fasting blood sugar, triglyceride, cholesterol levels, insulin, and ghrelin levels were measured. **Results.** The mean serum ghrelin level was 45.41} 22.41 in the psoriasis group and 29.92} 14.65 in the healthy control group. Serum ghrelin level was significantly higher in the psoriasis group compared with the controls (P= 0.01). The mean ghrelin level in patients with a lower PASI score was significantly higher than in those with a higher PASI score (P = 0.02). **Conclusion.** The present study was performed to determine the effects of ghrelin in psoriasis patients. We found a negative correlation between severity of psoriasis and ghrelin level. Larger and especially experimental studies focusing on correlation of immune system-ghrelin levels and severity of psoriasis may be valuable to clarify the etiopathogenesis of the disease.

KEYWORDS

INTRODUCTION

Psoriasis is a chronic inflammatory disease that affects approximately 1–3% of the general population [1]. In addition, psoriasis is characterized by local and systemic increases in levels of proinflammatory cytokines, such as interleukin- 6 (IL-6) and tumor necrosis factor-alpha (TNF-) [2]. Proinflammatory cytokines in chronic inflammation lead to atherogenesis and peripheral insulin resistance, which in turn cause hypertension and type II diabetes mellitus (DM) [3, 4]. In addition, recent studies have indicated a relationship between psoriasis and metabolic syndrome [5, 6]. Ghrelin is a 28-amino acid peptide hormone secreted mainly by the mucosa of the stomach [7]. Ghrelin, thought to be a stimulator of growth hormone (GH) secretion [7] and food intake [8], also shows potent inhibitory effects on proinflammatory mediators via its effect on T cells and monocytes [9].

Previous studies have focused on the relationship between metabolic syndrome and psoriasis. The present study was performed to determine the effects of ghrelin on metabolic changes and the correlation between ghrelin level and disease severity in patients with psoriasis.

Patients and Methods

The study population consisted of 25 patients with chronic plaque psoriasis patients (11 males and 14 females) all of whom had been referred to the Department of Dermatology of Elazig Education and Research Hospital and Department of Dermatology of PSM Hospital. 21 healthy control subjects were also enrolled in the present study. All psoriasis patients had symptoms for at least 6 months and had not received any systemic or local anti-psoriatic treatment for the last 4 weeks.

Exclusion Criteria

(1) Patients with pustular psoriasis, erythroderma, and psoriatic arthritis,
(2) Systemic diseases (diabetes and hypertension),
(3) Age < 18 years
(4) Pregnancy
(5) Acute or chronic infection
(6) Acute or chronic neurological disorders
(7) Polycystic ovary syndrome or amenorrhea
(8) Hyperthyroidism or hypothyroidism

Study Plan

The patients enrolled in the present study were questioned regarding age, gender, age of onset, duration of disease, history of smoking and alcohol use, height, weight, body mass index (BMI), and waist circumference. In addition, fasting blood sugar, triglyceride, low-density lipoprotein (LDL), very-low-density lipoprotein (VLDL), high-density lipoprotein (HDL), total cholesterol, HbA1c, insulin, Cpeptide levels, thyroid stimulating hormone (TSH), T3, T4, and ghrelin levels were measured. Ghrelin levels may be affected by many metabolic factors, so patients and controls had similar BMI to decrease the different metabolic factors in patients with psoriasis
The control group comprised age-, sex-, and BMImatched individuals who did not have any systemic or neurological diseases and did not use drugs or alcohol.

Collection and Storage of Biological Samples

As ghrelin is a peptide hormone and can be broken down by proteases, aprotinin (500 Kallikrein units per mL) was added to plain biochemistry tubes before collection of blood samples from the participants to prevent proteolysis. Blood samples were collected at 09.00–10.00 in the morning after an overnight fast to avoid any effects associated with circadian rhythm. Samples (5 mL) were collected from each participant after fasting and centrifuged at 3000 ×g for 5 min. The sera obtained were transferred to Eppendorf tubes and frozen at −80 C until the day of analysis.

RESULTS

The study population consisted of 25 patients with psoriasis who presented at the Dermatology Polyclinics of PSM Hospital. Twenty-five healthy volunteers were also included in the control group. The mean ages of the participants were 32.24 ± 7.54 years for the patients with psoriasis and 31.40 ± 6.77 years for the control subjects. The femaleto-male ratio (F/M) was 14/11 in all groups. There were no significant differences between the groups in terms of mean age or gender (P > 0.05). Similarly, there was no significant difference in BMI between the psoriasis and control groups (P > 0.05). The demographic characteristics and clinical findings of the two groups are presented in Table 1

Table 1: Demographical and clinical findings of groups

	Psoriasis vulgaris (25)	Control (25)	P
Gender (F/M)	14/11	14/11	> 0.05
Age *(year)	32.24 ± 7.54	31.40 ± 6.77	> 0.05
BMI *(kg/m2)	24.96 ± 2.53	23.80 ± 1.50	> 0.05
BMI score *	2.48 ± 0.65	2.28 ± 0.45	> 0.05
Waist	86.84 ± 10.22	83.72 ± 8.48	> 0.05
circumference *(cm)			

The mean disease duration in psoriasis patients was 11.84±7.79 years. In addition, nail involvement was observed in 5 patients (20.0%), genital involvement in 3 patients (12.0%), and scalp involvement in 20 patients (80.0%).

The relationships between involvement/severity of psoriasis and QOL were examined, and higher PASI score was shown to be associated with poorer QOL—the QOL scores were 6.00 ± 3.42, 6.37 ± 2.61, and 7.50 ± 4.78 in patients with low, moderate, and high PASI scores, respectively. However, the differences among these groups were not statistically significant (P > 0.05). The mean serum ghrelin level was 45.41 ± 22.41 in the psoriasis group and 29.92 ± 14.65 in the healthy control group, and this difference was significant (P = 0.01)

Mean serum insulin level and HOMA-IR index in the psoriasis group (4.79 ± 3.46 and 0.99 ± 0.70, resp.) were significantly lower than those in the healthy controls (8.56 ± 4.33 and 1.80 ± 0.97, resp.) (P = 0.002 and P = 0.001, resp.) (Table 3, Figure 1). Insulin resistance was observed in two patients in the psoriasis group (8.0%) and four subjects in the control group (16.0%). As the number of patients with insulin resistance was low, it was not possible to statistically

In 10 (40.0%) psoriasis patients and 9 (36.0%) control subjects, metabolic syndrome was discovered. Patients with psoriasis who had greater mean serum ghrelin levels than those who did not lacking metabolic syndrome, while there was no statistically significant difference (54.21 ± 23.02 and 39.55 ± 20.69, respectively; P > 0.05).

Furthermore, compared to patients without metabolic syndrome (29.60 ± 5.55, 12.78 ± 10.74, resp.) (BSA = 0.02, resp.), the mean age and BSA of psoriasis patients with metabolic syndrome (36.20 ± 8.65, 27.62 ± 19.98, resp.) were significantly greater. 10 psoriasis patients in our study also had MetS. Three individuals (30%) exhibited mild psoriasis, four individuals (40%) had moderate psoriasis, and three individuals (30%) had severe psoriasis. Patients with poor PASI scores did not have a greater MetS ratio than the other groups.

Between the psoriasis patients with and without metabolic syndrome, there were no significant changes in PASI, DLQI, or illness duration (all P > 0.05). The average serum There was no significant difference in ghrelin levels between patients who were male and female (48.04 ± 23.99 and 42.07 ± 20.85, respectively; p > 0.05).

BMI and DLQI showed a favorable connection (r = 0.46, r < 0.05). Therefore, in psoriasis patients, a higher BMI has a detrimental impact on QOL. Remarkably, there was a negative relationship (r = 0.49, r < 0.05) was seen between the blood ghrelin level and PASI.

DISCUSSION

About 15–25% of people in general suffer from metabolic syndrome [15, 16]. Furthermore, it has been proposed by new research that individuals with psoriasis may be more likely to develop metabolic syndrome. Patients with psoriasis have a documented prevalence of metabolic syndrome ranging from 14% to 40% [17]. 40% of psoriasis patients in the current study had metabolic syndrome, which is in line with occurrences documented in the literature.

It is unclear exactly what mechanism contributes to the genesis of metabolic syndrome in psoriasis patients. According to certain research, psoriasis patients are more likely to develop fat or hypertension as a result of stress and less physical exercise [18]. Consequently, it is believed that insulin resistance and abdominal obesity are key factors in the etiology of metabolic syndrome [19, 20]. Furthermore, a study by Sommer et al. [21] revealed a substantial correlation between psoriasis and type II diabetes, hypertension, hyperlipidemia, and coronary artery disease.

581 patients. There were no differences in fasting blood glucose, triglyceride, cholesterol, HDL, LDL, or VLDL values between psoriasis patients and controls in this investigation. Furthermore, Naldi et al. [22] discovered a greater incidence of psoriasis in the obese population and demonstrated a correlation between BMI and psoriasis. In the current investigation, we did not discover any variations in waist circumference or BMI between the groups. The similar BMIs of the patients and controls in our study may have contributed to the differences between the current and earlier investigations.

The connection between the severity of psoriasis and metabolic syndrome is a topic of debate in the research.

While Gisondi et al. [23] found no such association, Sommer et al. [21] revealed a favorable correlation between the severity of the disease and the metabolic syndrome. In the current investigation, we did not detect a positive link between PASI and metabolic syndrome; however, among our participants, BSA showed a positive correlation with metabolic syndrome.

A small number of studies have suggested connections between metabolic syndrome and high levels of inflammatory mediators, including IL-6, TNF- , and C-reactive protein [24]. Furthermore, psoriasis is a long-term inflammatory skin condition that is characterized by a range of inflammatory and immunological abnormalities. Thus, the connection between psoriasis and Proinflammatory cytokine release and the consequences of long-term inflammatory alterations may be linked to metabolic syndrome [25].

A few restrictions applied to this investigation, including the limited patient population. Furthermore, our study was not able to examine the effects of a number of endogenous and exogenous factors, such as food and reduced physical activity, on blood levels of ghrelin. Furthermore, we were unable to investigate immunological markers that may have been impacted by ghrelin and linked to metabolic syndrome and psoriasis.

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