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Assessment of Serum Level of C1q/TNF Related-Protein Isoform 15 in Psoriatic Patients

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Abstract

Background: Psoriasis is a chronic inflammatory skin disease, affecting 1.5–3% of the world population. The pathogenesis of psoriasis is complex and depends on many factors, including genetic, neurogenic, hormonal and autoimmune. The present study aims to evaluate serum C1q/TNF-related protein isoform 15 (CTRP15) level in psoriatic patients. This case control study included 80 subjects divided into 2 groups **Group A** included 50 patients suffering from generalized plaque psoriasis and **Group B** included 30 apparently healthy individuals of matched age and sex were chosen as a control group. All subjects were selected from the Outpatient Clinic of Dermatology and Andrology at Benha University Hospital from October 2020 to April 2021. Patients were told to stop using topical therapy for 2 weeks or systemic therapy for 4 weeks before the study. Psoriasis was diagnosed clinically and confirmed by dermoscopic examination and curttage test. All the patients were subjected to full history taking, complete clinical examination, and laboratory investigations as Fasting blood glucose, Lipid profile (TC,TG,HDL and LDL). Results & Conclusion: The present study showed that the mean age of psoriasis group was 46.3 years, they were 32 males (64%) and 18 females (36%). In addition to 30 healthy control group of matched age and gender ($p>0.05$ for each). no significant differences were found between studied groups regarding blood pressure. The present work found that patients had significantly higher BMI and WC when compared to control group and positive family history of psoriasis.

Keywords: C1q; TNF; Related-Protein Isoform; Psoriasis

1. Introduction

Psoriasis is a chronic inflammatory skin disease, affecting 1.5–3% of the world population. The pathogenesis of psoriasis is complex and depends on many factors, including genetic, neurogenic, hormonal and autoimmune [1].

There are different clinical types of psoriasis , the most common is chronic plaque psoriasis, affecting 80% to 90% of patients with psoriasis. The hallmark of classic plaque psoriasis is well-demarcated, symmetric, and erythematous plaques with overlying silvery scale. Plaques are typically located on the scalp, trunk, buttocks, and extremities but can occur anywhere on the body. Other types, such as inverse, nail, pustular, and erythrodermic, can also occur [2].

The metabolic syndrome is a combination of disorders that include: obesity, insulin resistance, glucose intolerance, impaired regulation of body fat and high blood pressure. The two most significant risk factors for development of the metabolic syndrome are a large amount of fat around the abdomen (visceral obesity) and resistance of peripheral tissue cells to the effects of insulin [3].

Myonectin, is a member of CTRPs (C1q/TNF-related proteins), which are the conserved paralogs of adiponectin containing collagen-like and globular C1q-like domains [4]. Although most of CTRPs are predominantly expressed by adipose tissue, myonectin was originally identified as a myokine that is abundantly expressed in skeletal muscle tissue, in particular, type I muscle fibers. Myonectin expression in skeletal muscle and blood is shown to be upregulated by voluntary exercise [5]. Its serum levels are tightly regulated by the metabolic state. Fasting suppresses and re-feeding dramatically increases CTRP15 mRNA levels [6].

Psoriasis is associated with numerous comorbidities including psoriatic arthritis, cardiovascular disease, metabolic syndrome, and obesity [7]. Compared with the general population, psoriasis patients have higher prevalence of metabolic syndrome, and patients with more severe psoriasis have greater odds of metabolic syndrome than those with milder psoriasis [8].

Several studies have revealed a strong association between metabolic syndrome and psoriatic diseases ,regardless of PS severity or casualty Furthermore, other studies are establishing the association of the increase of body mass index (BMI), hip and waist circumference, and insulin concentration (which are the main components in MS) with the severity of PS [9].

Serum CTRP15 levels were significantly increased in metabolic syndrome individuals and individuals with increasing number of metabolic syndrome components such as insulin resistance, hypertension, and central obesity. These results suggest that CTRP15 may be a circulating biomarker for MetS and insulin resistance-related metabolic diseases [10].

The present study aims to evaluate serum C1q/TNF-related protein isoform 15 (CTRP15) level in psoriatic patients .

2. Patients and methods

This case control study included 80 subjects divided into 2 groups Group A included 50 patients suffering from generalized plaque psoriasis and Group B included 30 apparently healthy individuals of matched age and sex were chosen as a control group. All subjects were selected from the Outpatient Clinic of Dermatology and Andrology at Benha University Hospital from October 2020 to April 2021.

Written informed consents were obtained from all participants. The study was approved by the Ethics Committee on Research involving Human Subjects of Benha Faculty of Medicine.

Patients were told to stop using topical therapy for 2 weeks or systemic therapy for 4 weeks before the study. Psoriasis was diagnosed clinically and confirmed by dermoscopic examination and curttage test.

All the patients were subjected to full history taking, complete clinical examination, and laboratory investigations as Fasting blood glucose, Lipid profile (TC,TG,HDL and LDL), and serum C1q/TNF-related protein isoform 15(CTRP15).

2.1. Statistical analysis

The collected data were revised, coded, tabulated and introduced to a PC using Statistical package for Social Science (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Data were presented and suitable analysis was done according to the type of data obtained for each parameter. Shapiro test was done to test the normality of data distribution. Descriptive statistics: Mean, Standard deviation (± SD) for parametric numerical data. Frequency and percentage of non-numerical data. Analytical statistics: Student T Test was used to assess the statistical significance of the difference between two study group means. For the comparison of the three groups' means, one way analysis of variance (ANOVA) was used. Chi-Square test was used to examine the relationship between two qualitative variables. Fisher's exact test: was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells. Correlation analysis: To assess the strength of association between two quantitative variables. The correlation coefficient defines the strength and direction of the linear relationship between two variables. A *p* value is considered significant if <0.05 at confidence interval 95%.

3. Results

This study included 80 subjects divided into two groups. The first group included 50 patients with generalized plaque psoriasis, and the second group included 30 healthy control subjects of matched age and gender. No significant difference was reported between both groups regarding age and gender (p>0.05 for each) **(Table 1).**

Table (1) Comparison of demographic data among studied groups.

		Control N=30		Patients N=50		*P*
Age (years)	**Mean±SD**	44.8	±13	46.3	±12.8	0.628
Males	**N, %**	16	53.3%	32	64%	0.346
Females	**N, %**	14	46.7%	18	36%	

SD, standard deviation; student t test was used for numerical parameters; chi square was used for comparison between categorical data.

No significant difference was found between studied groups regarding blood pressure **(Table 2).**

Table (2) Comparison of blood pressure(BP) among studied groups.

	Control N=30		Patient N=50		*p*
	mean	**SD**	**mean**	**SD**	
SBP (mm Hg)	117.2	±10.1	122.5	±9.5	0.120
DBP (mm Hg)	78.7	±7.8	80.7	±4.8	0.153

SD, standard deviation; student t test was used for numerical parameters.

Patients had significantly higher BMI and WC when compared to control group, positive family history had significantly higher rates in patients than controls **(Table 3)**.

Table (3) Comparison of anthropometric data and family history among studied groups**.**

	Control N=30		Patients N=50		*p*
	mean	**SD**	**mean**	**SD**	
BMI (kg/m^2)	27.1	5.2	31.1	7.8	**0.015**
WC (cm)	93.7	13.6	100.5	13.8	**0.035**
Positive family history	1	3.3	11	22	**0.026**

SD, standard deviation; student t test was used for numerical parameters.

4. Discussion

This case control study included 50 patients suffering from psoriasis (Group A). In addition, 30 apparently healthy individuals of matched age and sex were chosen as a control group (Group B). All patients were selected from the outpatient clinic of Dermatology and Andrology Department of Benh a University Hospital from October 2020 to April 2021. The present study showed that the mean age of psoriasis group was 46.3 years, they were 32 males (64%) and 18 females (36%). In addition to 30 healthy control group of matched age and gender ($p>0.05$ for each).

In agreement with our results **Jensen et al.** [11] who studied sleep disturbance in psoriasis, and a case series study for **Iskandar et al.** [12] who studied Systematic review examining changes over time and variation in the incidence and prevalence of psoriasis by age and gender, they found there was no agreement on differences in psoriasis incidence and prevalence between gender. Also **Dei-Cas et al.** [13] who studied Metagenomic analysis of gut microbiota in non-treated plaque psoriasis patients stratified by disease severity: development of a new Psoriasis-Microbiome Index ,they found the mean age of psoriasis group was 44.5 and no significant difference was found between studied groups regarding gender .

Regarding comparison of blood pressure among studied groups, the current work showed no significant differences were found between studied groups regarding blood pressure.

In support of our results, **Blegvad et al.** [14] who studied Clinical characteristics including cardiovascular and metabolic risk factors in adolescents with psoriasis found that there was no significant difference between studied groups regarding blood pressure. Also **Kim and Lee** [15] found that no significant difference in blood pressure was noted between psoriasis patients and control group (p=0.100)

These results disagreed with **kim et al.** [16] who studied Hypertension and risk of psoriasis incidence: An 11-year nationwide population-based cohort study reported that the risk of psoriasis incidence was increased among patients with hypertension, And **Duan et al.** [17] who studied A systematic review and meta-analysis of the association between psoriasis and hypertension with adjustment for covariates, Their results indicated that psoriasis was associated with an increased risk of hypertension compared to those without psoriasis, and the prevalence of hypertension in severe psoriasis patients was higher than that in mild psoriasis patients, and the risk of hypertension in psoriasis patients was higher than that in nonpsoriasis patients in Europe and Asia.

Regarding comparison of anthropometric data and family history among studied groups, The present work found that patients had significantly higher BMI and WC when compared to control group and significantly higher value for family history of psoriasis.

In agreement with our results **El-Komy et al.** [18] who studied clinical and epidemiologic features of psoriasis patients in an Egyptian medical center reported that family history of psoriasis which is considered one of the risk factors for the development of the disease was present in 17.5% of their study.

In support of our results **Snekvik et al.** [19] and **Petridis et al.** [20] they observed a positive association between psoriasis and objective measures of body mass index (BMI)and waist circumference .Also, **Han et al.** [21] found increased psoriatic risk associated with BMI and WC, they found that the high WC/high BMI group and the high WC/normal BMI group both showed significantly increased psoriatic risk compared with the groups with normal WC.

5. Conclusion

Psoriasis is a chronic inflammatory skin disease, affecting 1.5–3% of the world population. The present study showed that the mean age of psoriasis group was 46.3 years, they were 32 males (64%) and 18 females (36%). Patients had significantly higher BMI and WC when compared to control group and significantly higher value for family history of psoriasis.

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