

Assessment of Micro-Albuminuria and Renal Artery Resistance Index in Psoriatic Patients

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Abstract

Psoriasis is a common chronic inflammatory skin disease with a spectrum of clinical phenotypes and results from the interplay of genetic, environmental, and immunological factors. Micro albuminuria is considered to be maker of glomular disease and can be used to predict diabetic or hypertensive nephropathy. The aim of the study was to evaluate micro-albuminuria and renal artery resistance index in psoriatic patients as an early diagnostic marker of kidney affection. Methods: This was a cross sectional case\control study, included 84 subjects classified into two groups: Patient group: 50 patients complaining of psoriasis. Control group: 34 apparently healthy of matched age and sex as control group. Each patient was subjected to full history taking, and complete clinical examination, Clinical assessment of psoriatic lesions is done to determine the distribution, clinical variants and the extent of psoriasis. Assessment of psoriasis grade was done using PASI score. All studied subjects were tested for: Measuring microalbuminuria in urine by ELISA. Results and conclusion: On comparing both groups of patients and controls in this study there was a significant increase of the mean level of microalbuminuria in psoriatic patients compared with controls. There was a positive correlation between the level of microalbuminuria and severity of psoriasis (PASI score) with a significant value. Microalbuminuria and renal artery resistance were elevated in psoriatic patients and has positive correlation with disease severity and may have a role in disease pathophysiology.

Keywords: Micro-Albuminuria, Renal, Psoriasis, Resistance Index.

1. Introduction

Psoriasis is a multisystem disease with predominantly skin and joint manifestations affecting approximately 2% of the population. The major manifestation of psoriasis is chronic inflammation of the skin. It is characterized by disfiguring, scaling and erythematous plaques that may be painful or often severely pruritic and may cause significant quality of life issued [1].

Psoriasis is generally thought to be a genetic disease that is triggered by environmental factors. In twin studies, identical twins three times more likely to be affected compared to non-identical twins. This suggests that genetic factors predispose to psoriasis. Symptoms often worsen during winter and with certain medications, such as beta blockers or NSAIDs. Infections and psychological stress can also play a role. Psoriasis is not contagious. The underlying mechanism involves the immune system reacting to skin cells [2].

In a study done by Ryan et al., [3], patients with psoriasis had an increased prevalence of pathological microalbuminuria compared with controls. The positive correlation between the prevalence of pathological albuminuria and psoriasis severity may indicate a subclinical renal dysfunction in patients with psoriasis.

Micro albuminuria is considered to be maker of glomular disease and can be used to predict diabetic or hypertensive nephropathy. Doppler derived renal resistive index (RRI) has been used for years in variety of clinical setting such as: evaluation of progression risk in chronic kidney disease [4].

Clinical and experimental evidence indicates that an increased RRI in patients with primary hypertension not

only reflects changes in intra renal perfusion, but it is also associated with systemic hemodynamics and atherosclerosis, and may provide useful prognostic information and possibly have therapeutic implications [5].

The aim of the study was to evaluate micro-albuminuria and renal artery resistance index in psoriatic patients as an early diagnostic marker of kidney affection.

2. Patients and methods

This was a cross sectional case\control study, included 84 subjects classified into two groups:

I-Patient group: 50 patients complaining of psoriasis.

II-Control group: 34 apparently healthy of matched age and sex as control group.

Patients were recruited from the outpatient clinic of Dermatology and Andrology Department of Benha University Hospitals between October 2018 and February 2019.

The study was approved by the local ethic committee on human research of Benha Faculty of Medicine. Informed consent was obtained from each individual before being enrolled in the study.

2.1 Inclusion criteria

This study includes psoriatic patients which are:

- Male and female patients suffering from plaque psoriasis more than 6 months durations.
- Ages more than 18 years old.
- PASI score more than 8.
- Patients stopped treatment one month before beginning of the procedure.

2.2 Exclusion criteria

Patients with any of the following were excluded:

- Patients with other autoimmune or allergic diseases to avoid false positive results.
- Patients with hepatic diseases to avoid false positive results.
- Patients with unstable psoriasis (pustular, erythrodermic).
- Pregnant patients.
- Patients who refuse to participate in the study.
- Patients with other dermatological diseases.

Each patient was subjected to full history taking, and complete clinical examination, Clinical assessment of psoriatic lesions is done to determine the distribution, clinical variants and the extent of psoriasis. Assessment of psoriasis grade was done using PASI score: Psoriasis Area and Severity Index (PASI) score is a tool used to measure the severity and extent of psoriasis. It takes a few minutes and experience to calculate it accurately.

All studied subjects were tested for: Measuring microalbuminuria in urine by commercial ELISA kit (Carl-Zeiss-Strabe49-5155129 Mainz-Germany). And Measuring renal artery resistance index by Doppler ultrasound.

2.3 Statistical analysis

The clinical data were recorded on a report form. These data were tabulated and analysed using the

computer program SPSS (Statistical package for social science) version 20 to obtain: Descriptive statistics were calculated for the data in the form of: Mean and standard deviation (\pm SD). Median and inter-quartile range (IQR) for quantitative data. Frequency and distribution for qualitative data. Analytical statistics : In the statistical comparison between the different groups, the significance of difference was tested using one of the following tests. Student's *t*-test:- Used to compare mean of two groups of quantitative data. ANOVA test (F value):-Used to compare mean of more than two groups of quantitative data. Inter-group comparison of categorical data was performed by using chi square test (X^2 -value) and fisher exact test (FET).

3. Results

The current study included fifty psoriatic patients; 38 males 76.0% and 12 females 24.0%. Their ages ranged from 22-75 years with a mean age of 49.86±11.22 years. Thirty Four clinically free individuals served as a control group; 24 males 70.6% and 10 females 29.4%. Their ages ranged from 31-66 years with a mean age of 46.71±16.7 years. Smoking habit found in 17 (34%) and 14 (41.2%) in case and control group respectively.

Comparison between patients and control showed no significant difference regarding sex , age, BMI, smoking respectively (p=0.58, 0.30, 0.028, 0.50 Resp) Table (1).

Table (1) Personal characteristics of the studied groups.

	patients group (50)		Control group (34)		Statistical test	P value
	No	%	No	%		
Gender	38					
Male	12	76.0	24	70.6	$X^2=0.31$	0.58
Female		24.0	10	29.4		
Mean ±SD	49.86±11.22		46.71±16.7		St t=1.04	0.30
BMI	29.42±2.52		27.97±3.43		St t=2.23	0.028
Mean ±SD						
Smoking						
Yes	17	34.0	14	41.2	$X^2=0.45$	0.50
No	33	66.0	20	58.8		

St t = student t test, x^2 =chi square test.

Results of the study showed that 8 patients (16.0%) had positive family history for psoriasis. The mean

duration of psoriasis was 18.96±8.9 years and the mean PASI score was 10.27±2.04 Table (2).

Table (2) Clinical characteristics among studied groups.

	Patients group (50)	
	No	%
Duration (years)	18.96±8.9	(2-40)
Mean ±SD (range)		
Family history		
Yes	8	16.0
No	42	84.0
PASI Score	10.27±2.04	(8-14.1)
Mean ±SD (range)		

The mean microalbuminuria levels was significantly higher in psoriatic patients (18.08) than control group (11.77) with a significant value (p =0.001) Table (3).

Table (3) Microalbuminurea level of the studied groups.

	Patients group (50)	Control group (34)	Statistical test	P value
Microalbuminurea Mean ±SD	23.04±18.08	11.77±7.17	St t=3.45	0.001**

St t test= student test.

Mean microalbuminurea level in female patients was higher than male patients without a significant value (p=0.14). The mean microalbuminurea level in patients with +ve family history was higher than patients with -ve

Family history without significant value (p =0.60). Mean microalbuminurea level in smoking patients was higher than non-smoking patients with a highly significant value (p=<0.001**) Table (4).

Table (4) Mean Microalbuminuria differences of patients group according to gender, family history and smoking.

Patients group (50)	No	Microalbumin		Statistical test (t)	P value
		Mean	±SD		
Gender					
Male	38	20.91	17.03	1.5	0.14
Female	12	29.79	20.38		
Family history					
Present	8	26.14	16.28	0.52	0.60
Absent	42	22.45	18.52		
Smoking					
Yes	17	37.01	23.12	4.69	<0.001**
No	33	15.85	8.73		

St t test= student t test.

Mean microalbuminurea level in severe PASI score patients was higher than moderate PASI score patients with a highly significant value (p=0.007**) Fig (1).

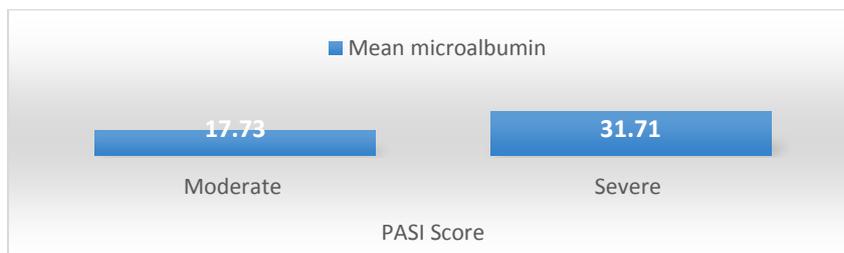


Fig (1) Receiver operating characteristics (ROC) analysis of microalbuminurea for discrimination between patients and control .

In psoriatic patients, there was positive correlations between microalbuminuria level and PASI score, RT renal artery RI, LT renal artery RI with a significant

value as p value (0.001, 0.021& 0.036) respectively Table (5).

Table (5) Correlation between microalbuminurea and other quantitative variables.

Micro albumin	Correlation coefficient	P value
Age	-0.19	0.18
BMI	-0.05	0.72
Age of onset	-0.16	0.28
Duration	-0.07	0.65
PASI score	0.495	<0.001**
Rt renal artery RI	0.352	0.021*
Lt renal artery RI	0.297	0.036*

Receiver operating characteristics (ROC) analysis of microalbuminuria for discrimination between patients and control : Results of the study showed that

microalbuminuria had positive sensitivity followed by specificity with a significant value (P value <0.05) Fig (2).

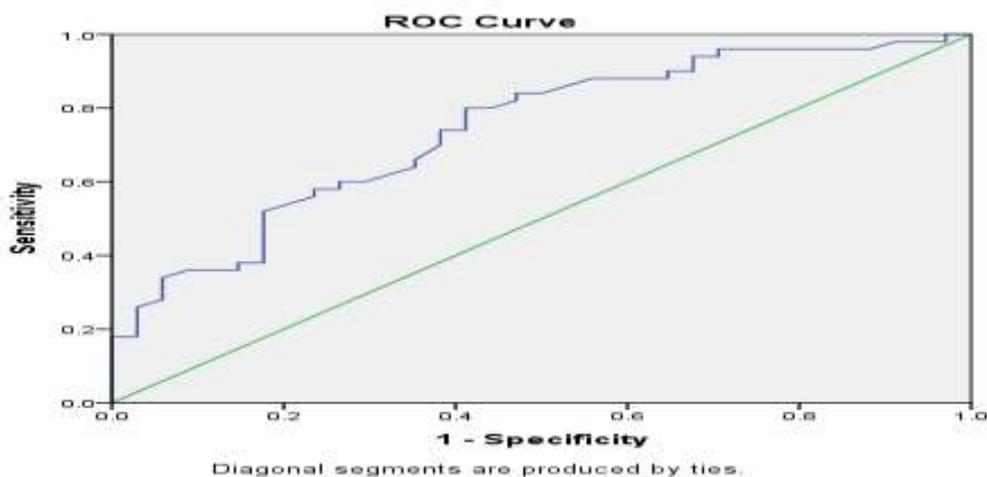


Fig (2) Receiver operating characteristics (ROC) analysis of microalbuminuria for discrimination between patients and control.

4. Discussion

Psoriasis is a chronic, inflammatory, immune-mediated skin condition that is characterized by well-demarcated, erythematous plaques with silver scales, which can be associated with potential symptoms of pruritus, pain, skin tightness, bleeding, and flaking [6].

In the current study, there was no significant difference between psoriatic patients and control groups regarding sex.

Zalewska et al. [7], found in the clinical approach, that psoriasis as a chronic disease is defined as diseases of a long duration, but of milder course than acute illnesses. These results agreed with the current study, which reported that psoriatic patients suffered from the disease for long period of time, which denotes that psoriasis is a chronic disease.

In the current study, there was highly significant difference between course of psoriasis and microalbuminuria. These results showed that psoriatic patients with progressive course have higher microalbuminuria level than psoriatic patients with intermittent course.

In the current study, there was nonsignificant value between patients with positive family history and negative family history, although microalbuminuria level was higher in patients with positive family history than those patients with negative family history. These results were in agreement with those of [8], who found nonsignificant difference between patients and control subjects regarding family history.

The obtained results demonstrated that only 16.0% of psoriatic patients have positive family history. Psoriasis has been sub classified according to age of onset. Early onset psoriasis (also referred to as type I) has onset before the age of 40 years, with peak onset at 16–22 years of age, and comprises 70% of all psoriatic. Late-onset psoriasis, also termed type II psoriasis, shows

onset at or after age 40 years, with a peak age of onset between 57 and 60 years. A distinct pattern of HLA association has been reported. Hence, with early onset psoriasis, which also displays a strong family history, a strong association with class I HLA alleles, and specifically HLA-C*06, is observed. In contrast, type II psoriasis is more sporadic and rarely familial and its genetic background is unclear [9]. Results of Kim et al. [10], demonstrated increased severity of skin lesions and nail affection in early onset psoriasis with strong family history of psoriasis.

Central obesity, hypertension, hyperglycemia, and dyslipidemia are the main components of metabolic syndrome or syndrome X [11]. Study of Gisondi et al. [12] conducted that the prevalence of metabolic syndrome in patients with psoriasis ranges from 20% to 50%, with a risk of having metabolic syndrome is at least double in psoriatic patients compared with non-psoriatic control individuals. The association between psoriasis and metabolic syndrome has important clinical implications and the strength of these associations has been repeatedly confirmed by several observational studies. Thus improve the strong association between psoriasis with hyperlipidemia and hyperglycemia which are components of metabolic syndrome.

In the current study, there was nonsignificant value between males and females regarding microalbuminuria level, although micro albuminuria level was higher in females than males. These results agreed with the previous finding of Kaur et al, [13] reported no sex predilection among study patients.

The current study showed that there was statistically highly significant positive correlation found between microalbuminuria and PASI score.

So, severe cases of psoriasis can be associated with high level of micro albuminuria, therefore micro albuminuria can be a biomarker of psoriasis severity.

In the current study, there was highly significant difference between smoking psoriatic patients and non smoking psoriatic patients. these results showed that smoking patients have higher microalbuminuria level than non smoking patients.

In the current study, there was non significant difference between microalbuminuria level and nail affection, although micro albuminuria level was in patients without nail affection than in patients with nail affection.

In the current study, there was a highly significant difference in left renal artery resistance index value in psoriatic patients than psoriatic patients. and there was a significant difference in right renal artery resistance value in psoriatic patients than non psoriatic patients.

In the current study, there was nonsignificant difference between microalbuminuria level and history of arthritis, history of previous of treatment and history of systemic disease.

Results of the current study showed that microalbuminuria levels and renal artery resistance index were significantly higher in psoriatic patients when compared to controls.

5. Conclusion

Microalbuminuria and renal artery resistance were elevated in psoriatic patients and has positive correlation with disease severity and may have a role in disease pathophysiology.

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