

Periostin (rs3829365) Gene Polymorphism and Cardiac Function in Psoriasis

M.Sh.Elnaggar¹, Sh.I.Farag², A.I.Mustafa³, N. F. Alhusseini⁴ and N.W.Mikhael³

¹(M.C.C.H), Tanta Univ, Tanta, Egypt

²Cardiology Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

³Dermatology, Venereology and Andrology Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

⁴Medical Biochemistry and Molecular Biology Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

Abstract

Psoriasis considered a chronic inflammatory skin disease characterized by spontaneous remissions and exacerbations. The lesions are characterized by circumscribed, dry, erythematous plaques of various sizes covered by silvery white scales. Periostin gene (POSTN) in human is located in the long arm of chromosome 13 (13q13.3) and spans approximately 36 kb, It has 23 exons and encodes for a protein of 836 amino acids with a molecular weight of 93 kD, it was renamed periostin due to its localized expression in the periosteum and the periodontal ligament. The aim of this study was to reveal the association between periostin (rs3829365) gene polymorphism and psoriasis susceptibility. Blood samples were taken from psoriasis patients and control group for genotyping of Periostin gene using PCR. Regarding periostin gene polymorphism, CG and GG genotypes showed higher distributions among psoriasis patients than control and total polymorphism showed higher distributions when compared to CC genotype frequency and G allele carry a risk factor for psoriasis susceptibility. Periostin genopolymorphism(rs3829365) genotypes frequencies CG, GG and (CG+GG) and G allele might play a role in psoriasis pathogenesis.

Key Words: Psoriasis, psoriasis patients, Periostin gene.

1. Introduction

Psoriasis is a complex autoimmune disease characterized by chronic recurrent reddish patches covered with silvery-white scales. It is a common disease affecting approximately 120-180 million people worldwide around 150,000 new cases of psoriasis are reported annually. However, the prevalence of psoriasis varies significantly depending mainly on race, geographic location, genetics, and environmental factors [1].

The disease has multifactorial etiology including genetic background, environmental factor, vascular and immune system disturbance [2].

Many implicated genes are associated with immune pathways, suggesting that genetic variation may be directly responsible for dysregulation of inflammatory pathways in psoriasis, whereas others are responsible for skin barrier function and epidermal proliferation [3]. The periostin gene (POSTN) in human is located in the long arm of chromosome 13 (13q13.3) and spans approximately 36 kb. It has 23 exons and encodes for a protein of 836 amino acids with a molecular weight of 93 kD [4].

The aim of this study was to reveal the association between periostin (rs3829365) gene polymorphism and psoriasis susceptibility.

2. Patients and methods

This study conducted as a case-control study, included 50 patients suffering from psoriasis (patients group). In addition, 50 apparently healthy

individuals of matched age and sex as a control group (control group). All patients were selected from the outpatient clinic of Dermatology and Andrology of Benha University Hospitals.

Psoriasis patients group aged (18-60) years old with different variants and degrees of severity of psoriasis according to psoriasis Area And Severity Index (PASI) score.

Patients suffering from some types of cancers (breast cancer, lung cancer, prostate cancer or epithelial ovarian cancer).

Patients group were classified according to Psoriasis Area and Severity Index (PASI) score into mild psoriasis <15, moderate psoriasis 15-25 and severe psoriasis >25

2.1 Molecular biology investigations

Venous blood samples (2ml) were collected from both patients and control subjects under complete aseptic conditions in EDTA containing tubes. The blood was used for DNA extraction and the extracted DNA was stored at -80°C until the analysis of periostin(rs3829365) gene polymorphism by polymerase chain reaction (PCR) and restricted fragments length polymorphism (RFLP) method.

The expected genotypes would appear as follow;

-C/C :269,142 bp

-G/G :411 bp

-C/G :411,269,142 bp

2.2 Statistical analysis

It was performed using Statistical package for Social Science (Mean, Standard deviation (\pm SD),

Shapiro test, Student T test, (ANOVA) test, Chi-Square test and Hardy–Weinberg equilibrium).

3. Results and discussion

Table(1) Comparison of POSTN genotypes and alleles distribution between psoriasis patients and control group

	Psoriasis N=50		Control N=50		P	OR	95% CI
	N	%	N	%			
CC	22	44	43	86		1	(reference)
CG	19	38	6	12	<0.001	3.074	1.648-5.735
GG	9	18	1	2	0.003	5.464	1.809-16.501
CG+GG	28	56	8	16	<0.001	3.519	1.994-6.213
C	63	63	41	92		1	(reference)
G	37	37	9	8	0.017	2.675	1.169-6.123

OR, odds ratio; CI, confidence interval. Logistic regression test was used.

Taking CC genotype as reference, CG and GG genotypes showed significantly higher distribution among psoriasis patients than control group ($p < 0.001$ and 0.003 respectively). and CG+GG showed higher distribution among psoriasis patients when compared to CC genotype frequency also G allele showed significantly higher frequency in psoriasis patients when compared to control group, ($p 0.017$) as shown in Table (1).

Psoriasis is regarded as a multifactorial condition in which there is interaction between inherited susceptibility genes and environmental triggers. In the last decade, technological advances have enabled substantial progress in understanding the disease genetics [5].

Periostin gene located on chromosome (13q13.3) encodes a secreted extracellular matrix protein that functions in tissue development and regeneration, its polymorphisms could contribute to susceptibility to coronary artery disease (CAD) which is a leading cause of disease and death [6].

Periostin derived from fibroblasts causes proliferation and differentiation of keratinocytes and deficiency of it causes impaired epidermal hyperplasia in addition to down-regulated skin inflammation [7].

To achieve this goal, The present study was conducted on 50 psoriasis patients in addition to 50 healthy control subjects of matched age, sex of Egyptian origin. Both groups were in Hardy Weinberg equilibrium (HWE).

No previous studies reported that psoriasis susceptibility has a relation with periostin gene polymorphism but in the present work we observed a significant relation between POSTN (rs3829365) polymorphism and psoriasis susceptibility.

This study demonstrated that CG and GG genotypes showed significantly higher distribution among psoriasis patients than control group and CG+GG showed higher distribution when compared to CC genotypes and PASI score was higher in GG and CG genotypes and higher PASI score was associated with total polymorphism when compared to CC genotypes [8].

4. Conclusion

Periostin gene polymorphism (rs3829365) genotypes frequencies CG, GG and (CG+GG) and G allele might play a role in psoriasis pathogenesis, also psoriasis patients with this gene polymorphism were found to carry a risk for disease severity.

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