Prevalence of Autoantibodies in Patients of Psoriasis

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Psoriasis is a common chronic inflammatory disease of the skin and joints. Auto-antibodies have been reported in psoriasis patients. Objective of the study was to see the prevalence of various autoantibodies in patients of psoriasis and its correlation with gender, age, and type. Anti-nuclear antibody and antibody to double-stranded deoxyribonucleic acid were studied by indirect enzyme linked immunosorbent assay, rheumatoid factor was done by latex agglutination, whereas anti-thyroid microsomal antibody (anti-TMA) was by gelatin agglutination method. About 28.8% of psoriasis cases were positive for at least

one autoantibody. Age of onset ($P = 0.033$) and types of psoriasis ($P = 0.037$) had significant association with gender. Anti-double-stranded deoxyribonucleic acid ($P = 0.029$) and anti-thyroid microsomal antibody ($P = 0.002$) had significant association with types of psoriasis. Gender wise distribution of psoriasis in age group had significant ($P = 0.03$) association with anti-TMA. This study concludes that the auto-antibodies are found to be present in psoriasis patients or latent autoimmune diseases develop in psoriasis patients without any clinical symptoms. *J. Clin. Lab. Anal.* 24:44–48, 2010. © 2010 Wiley-Liss, Inc.

Key words: psoriasis; rheumatoid factor; anti double stranded deoxyribonucleic acid; anti nuclear antibody; anti thyroid microsomal antibody

INTRODUCTION

Psoriasis is a common chronic inflammatory disease of the skin and joints that involves 1–3% of general population. The prevalence of psoriasis in India varies from 0.5 to 1.5 (1). The disease is characterized by the hyperproliferation of keratinocytes which is triggered by T cells. (2) Etiopathogenesis of psoriasis is not completely understood. The presence of autoantibodies was reported in psoriasis patients without any clinical symptoms (3,4,5,6). Many autoimmune diseases have been reported to be associated with psoriasis such as rheumatoid arthritis, systemic lupus erythematosus (SLE), scleroderma, mixed connective tissue disease (MCTD), autoimmune thyroid disease, pernicious anemia, sjogren's syndrome, myasthenia (7,8,9). The aim of this study was to see the prevalence of various autoantibodies in patients of psoriasis and its correlation with gender, age, and types of psoriasis.

METHODS AND MATERIALS

Subjects

A total of 118 patients of psoriasis with mean age of 34.9 ± 16.5 year and disease duration 6.6 ± 8.7 year were taken from the Out Patient Department of Dermatology and Venereology of Sir Sunderlal Hospital, Banaras Hindu University, Varanasi during a period of 1 year. Psoriasis patients included 75 cases (63.6%) of plaque psoriasis, 27 cases (22.9%) of palmoplantar, 6 cases (5.1%) of psoriatic erythroderma, 4 cases (3.4%) of psoriatic arthritis, and 3 cases (2.5%) each of guttate as

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Received 29 June 2009; Accepted 6 December 2009

DOI 10.1002/jcla.20365

Published online in Wiley InterScience (www.interscience.wiley.com).

well as generalized pustular psoriasis and 50 volunteers from staffs and students of the institute were included in the study as normal healthy controls with no present and past history of autoimmune or any systemic disease with a mean age 30.2 ± 8.0 year. Clinical diagnosis of the patients was done by the dermatologist. Blood samples were taken when the patients first visited the dermatologist. The consent was given by all the patients enrolled in the study and the study was approved by the ethical committee of this institute.

Laboratory Analysis

Rheumatoid factor (RF) was done by latex agglutination method, kit of Tulip Diagnostics, Goa. Anti-double-stranded deoxyribonucleic acid (dsDNA) and anti-nuclear antibodies (ANA) were done by enzyme linked immunosorbent assay (ELISA), kit of Varelixa, Phadia, Germany, supplied by M/S OSB Agencies, Delhi, India. Patient's sample optical density (OD) was divided by cut-off OD to find out the ratio for ANA. The ratio of 1.4 or above of the sample was taken as positive. Serum level of dsDNA above 55 IU/ml was taken as positive. Anti-thyroid microsomal antibody (anti-TMA) was done by gelatin agglutination method, kit of Serodia, Japan. The titer of anti-TMA 1:100 or above was taken as positive.

Statistical Analysis

Analysis was performed using chi-square (χ^2) test on SPSS for windows (version 10.0) statistical package (SPSS Inc., Chicago, IL) computer statistics program. *P* values less than 0.05 were considered significant.

RESULTS

The distribution of psoriasis patients according to the age of onset revealed that about 75% patients had developed psoriasis in the first to fourth decades of their life. The age of onset of psoriasis was maximum (22.0%) in the second decade of life. In females, disease was seen comparatively at younger age and about 83.3% had disease onset at the age less than 40 year whereas only 68.8% male patients had developed psoriasis at the age less than 40 year and rest had developed psoriasis lesions above 40 year of age. About 54.2% (64/118) of the psoriasis patients were males and 45.8% (54/118) were females. Statistically significant ($P = 0.033$) difference was found in gender wise distribution of patients with the age of onset (Table 1).

Gender wise distribution of psoriasis patients revealed that plaque psoriasis was more prevalent in males (57.3%) whereas palmoplantar and psoriatic erythroderma were more prevalent in females (57.7 and 66.7%,

TABLE 1. Distribution of Psoriasis According to Age of Onset and Sex of Patients

Age in years	Male no (%)	Female no (%)	Total no (%)	<i>P</i>
> 10	3 (16.7)	15 (83.3)	18 (15.3)	0.033*
11–20	15 (57.7)	11 (42.3)	26 (22.0)	
21–30	14 (58.3)	10 (41.7)	24 (20.3)	
31–40	12 (57.1)	9 (42.9)	21 (17.8)	
41–50	10 (71.4)	4 (28.6)	14 (11.8)	
51–60	6 (60.0)	4 (40.0)	10 (8.5)	
61–70	4 (80.0)	1 (20.0)	5 (4.2)	
Total	64 (54.2)	54 (45.8)	118 (100.0)	

* $P < 0.05$, Significant.

TABLE 2. Distribution of Types of Psoriasis with Gender

Types of psoriasis	Male no (%)	Female no (%)	Total no (%)	<i>P</i>
Plaque psoriasis	43 (57.3)	32 (42.7)	75 (63.6)	0.037*
Palmoplantar psoriasis	12 (44.4)	15 (55.6)	27 (22.9)	
Psoriatic erythroderma	2 (33.3)	4 (66.7)	6 (5.1)	
Psoriatic arthritis	4 (100.0)	0 (0.0)	4 (3.4)	
Guttate psoriasis	3 (100.0)	0 (0.0)	3 (2.5)	
Pustular psoriasis	0 (0.0)	3 (100.0)	3 (2.5)	

* $P < 0.05$, Significant.

respectively). All three cases of psoriatic arthritis and all three cases of guttate psoriasis were males whereas all three cases of pustular psoriasis were females. Distribution of psoriasis patients in types of psoriasis with gender of patients was found to be statistically significant ($P = 0.037$) (Table 2).

A total of 34 (28.8%) cases of psoriasis were found to be positive for atleast one of the autoantibodies. One anti-TMA positive patient was also positive for RF. About 66.7% cases of pustular psoriasis, 33.3% cases of psoriatic erythroderma and guttate, 29.6% cases of palmoplantar, 28% cases of plaque psoriasis cases were positive for various autoantibodies whereas none of psoriasis arthritis cases were positive for any of the autoantibodies. Both RF positive reported cases were of palmoplantar. Correlation of autoantibodies with the types of psoriasis was found to be statistically significant for anti-dsDNA ($P = 0.029$), anti-TMA ($P = 0.002$) whereas it was non-significant for rest of the autoantibodies (Table 3).

Males were more ANA positive (57.1 vs. 42.9%) whereas anti-TMA was more positive in females (66.7 vs. 33.3%) and both RF positive cases were males but none of the autoantibody showed significant association with particular gender among our psoriasis cases (Table 4).

TABLE 3. Correlation of Various Types of Psoriasis with Different Autoantibodies

Auto antibody	Plaque Psoriasis	Palmo Planter Psoriasis	Psoriatic Erythroderma	Psoriatic Arthritis	Guttate Psoriasis	Pustular Psoriasis	<i>P</i>
ANA (20)	16 (80.0)	3 (15.0)	1 (5.0)	0 (0.0)	0 (0.0)	0 (0.0)	NS
Anti-dsDNA (04)	2 (50.0)	0 (0.0)	1 (25.0)	0 (0.0)	1 (25.0)	0 (0.0)	0.029*
Anti-TMA (09)	3 (33.3)	4 (44.4)	0 (0.0)	0 (0.0)	0 (0.0)	2 (22.2)	0.002*
RA (02)	0 (0.0)	2 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	NS
Total (35)	21 (60.0)	9 (25.7)	2 (5.7)	0 (0.0)	3 (8.6)	3 (8.6)	

RA factor, rheumatoid arthritis factor; ANA, anti-nuclear antibody; Anti-dsDNA, anti-double-stranded DNA; Anti-TMA, Anti-thyroid microsomal antibody.

* $P < 0.05$, significant; NS, non-significant.

TABLE 4. Correlation of Different Autoantibodies with Gender

Gender (numbers)	ANA positive (<i>N</i> = 20) no (%)	Anti-dsDNA positive (<i>N</i> = 04) no (%)	Anti-TMA Ab positive (<i>N</i> = 09) no (%)	RA positive (<i>N</i> = 02) no (%)
Males (64)	11 (17.2)	3 (4.7)	3 (4.6)	2 (3.1)
Females (54)	9 (17.3)	1 (1.9)	6 (11.1)	0 (0.0)
<i>P</i>	NS	NS	NS	NS

NS, non-significant.

TABLE 5. Gender Wise Distribution of Autoantibodies According to Age Groups

Autoantibodies	Age group (years)	Male <i>N</i> (%)	<i>P</i>	Female <i>N</i> (%)	<i>P</i>
ANA (20)	≤40	7/39 (17.9)	NS	7/40 (17.5)	NS
	>40	4/25 (16.0)		2/14 (14.3)	
Anti-dsDNA (4)	≤40	3/39 (7.7)	NS	1/40 (2.5)	NS
	>40	0/25 (0.0)		0/14 (0.0)	
Anti-TMA (9)	≤40	0/39 (0.0)	0.03*	5/40 (12.5)	NS
	>40	3/25 (12.0)		1/14 (7.1)	
RA (2)	≤40	0/39 (0.0)	NS	0/40 (0.0)	–
	>40	2/25 (8.0)		0/14 (0.0)	

* $P < 0.05$, significant; NS, non-significant.

Only seven cases of psoriasis were found to be positive for autoantibodies that were diagnosed as psoriasis for the first time whereas rest of the cases had given history of psoriasis for the last 6 months to 40 year (Mean $\pm$ SD = 7.0 ± 8.8 year). None of the patient positive for ANA and dsDNA antibody was clinically having SLE or any other autoimmune diseases as well as both RF positive patients also did not give any history of joint pain. But two anti-TMA positive patients were having hypothyroidism with high titer of anti-TMA of more than 1:1600 dilutions for the last 10 year and both were females.

Gender wise distribution of autoantibodies in psoriasis cases according to age group was found significantly ($P = 0.03$) associated with male in anti-TMA whereas in rest of the groups no significant

difference in the distribution of autoantibodies was found (Table 5).

DISCUSSION

The etiopathogenesis of psoriasis is poorly understood. There is a great debate that a link may exist between psoriasis and autoimmunity. Autoimmunity against various antigens has been described in psoriasis. A Japanese study demonstrated anti-stratum corneum IgG antibody in psoriasis patients and concluded that the autoantibodies are involved in the pathogenesis of psoriasis (10). Aoki et al. (11) reported elevated level of anti-keratin intermediate filament autoantibody in psoriasis cases. Perez-Lorenzo et al. (12) also reported the presence of autoantibody against antigens present in

keratinocytes. Anti-calpastatin autoantibody level was also found elevated in psoriasis patients (13). In our study 28.8% patients had various types of autoantibody such as RF, ANA, anti-dsDNA, and anti-TMA. Interestingly most of the patients did not have any clinical evidence of systemic autoimmune disease such as SLE, RF, scleroderma, Sjögren's syndrome, or any other autoimmune disease. Only two anti-TMA positive patients (22.2%) had past history of Hashimoto's thyroiditis and both were taking thyroxin.

Most of the literatures on RA, ANA, and anti-dsDNA in psoriasis include case reports. Astudillo et al. (14) reported that the association of psoriasis and SLE is uncommon. They reported three cases of SLE in 7-year period where psoriasis preceded the diagnosis of SLE. One of this psoriasis patients developed symptoms of SLE, with positive ANA and dsDNA Ab and they also reported that one of their SLE patient developed psoriasis at the site of scar after operation.

Zalla and Muller (8) identified 42 cases of SLE among 9400 psoriasis patients in 10-year retrospective study with prevalence of SLE in 0.69%. But in our study none of the patients had clinical evidence of SLE in ANA or anti-dsDNA positive cases.

Contrary to these studies, Kutukculer et al. (15) estimated various autoantibodies in patients of psoriasis and they reported that 5.8% cases were positive for RF, only one case was positive for ANA and dsDNA Ab.

Some workers also reported the development of the autoantibodies due to the treatment of psoriasis. Feletar et al. (16) reported 16 patients of refractive psoriatic arthritis. All of them were taking anti-TNF α antibody and 11 of them were taking methotrexate treatment together with anti-TNF α antibody and 50% of these patients showed positivity to ANA and six patients became positive for anti-dsDNA. Leitch and Haslock (5) reported a case of psoriasis following the minocycline treatment and developed positive ANA, anti-dsDNA Ab, anti-scleroderma 70 Ab, and anti-cardiolipin antibody whereas they reported that the patient neither had feature of rheumatoid arthritis nor any feature of SLE or any other autoimmune disease. On stopping the treatment patients recovered and autoantibody disappeared. While another study (17) reported that most of the patients of psoriasis who developed SLE were discoid lupus erythematosus who had exposure to ultraviolet light in Dead sea area Psoline ultra violet A (PUVA) therapy and sulphasalazine used in psoriasis also induced SLE.

We found anti-TMA in nine cases. Only two had previous history of autoimmune thyroid disease whereas rest cases were not having any clinical history of autoimmune thyroid disease. Earlier reports (18,19) have also described the presence of anti-TMA in

psoriasis patients. Antonelli et al. (19) studied 80 cases of psoriatic arthritis and reported higher prevalence of thyroid autoimmunity (28%) in psoriatic arthritis. Contrary to their results, none of our psoriatic arthritis cases were found to be anti-TMA positive.

The cause of autoimmunity in psoriasis is not clear. However, it may be due to the overlapping with location of some potent autoimmune genes and psoriasis genes (20), alteration in self tolerant proteins may elicit autoimmune response (21), or molecular mimicry is supposed to be one of the causes for autoimmunity, due to the structural similarity between streptococcal M protein with keratin 17 protein of skin (22).

Thus our study concludes that the autoantibodies are found to be present in psoriasis patients or latent autoimmune diseases develop in psoriasis patients without any clinical symptoms. Psoriasis has autoimmune etiology at least in one forth cases.

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