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Celiac Disease-Associated Antibodies in Patients With Psoriasis and Correlation With HLA Cw6

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Etiopathology of psoriasis is not completely understood. Patients with psoriasis show elevated sensitivity to gluten. The aim of this study was to see the expression of celiac disease (CD)-associated antibodies gliadin IgA, gliadin IgG, and tissue transglutaminase IgA, and their correlation with HLA Cw6 in patients with psoriasis. The study comprised 56 patients with psoriasis and 60 healthy controls (HC). The levels of antibodies were detected by using ELISA technique and HLA Cw6 typing was carried out by microcytotoxicity method. HLA Cw6 was significantly expressed in psoriasis cases when compared with HC ($P<0.05$). CD-associated antibodies gliadin IgA/IgG and tissue transglutaminase IgA were significantly higher in the serum of patient with psoriasis when compared with HC ($P<0.05$, <0.05, and 0.01, respectively). Serum anti tissue transglutaminase IgA (anti tTG IgA) was significantly higher in females when compared with males and expressed more in elderly patients. There was a significant positive correlation among the antibodies (anti gliadin IgA with anti gliadin IgG: $r=0.67$, $P<0.05$; anti gliadin IgA with anti tTG IgA: $r=0.45$, $P<0.05$, anti gliadin IgG with anti tTG IgA: $r=0.26$, $P<0.05$, respectively), whereas insignificant with HLA Cw6. Our study concludes that latent CD or CD-associated antibodies were present in patients with psoriasis and also concludes that HLA Cw6 has no association with expression of these antibodies in patients with psoriasis. J. Clin. Lab. Anal. 24:269–272, 2010. © 2010 Wiley-Liss, Inc.

Key words: psoriasis; celiac disease; anti gliadin IgA; anti gliadin IgG; anti tissue transglutaminase IgA

INTRODUCTION

Etiopathology of psoriasis is not completely understood. It is a chronic skin disease that affects about 2% of general population (1). Some patients with psoriasis show elevated sensitivity to gluten (1). Studies performed in Italy (2) Sweden (3,4), and United Kingdom (5) have shown increased prevalence of gluten sensitivity in patients with psoriasis. However, a study performed in USA showed no such association (6). A Swedish study has demonstrated that psoriasis patients with antibodies against gliadin improved on gluten-free diet and their psoriasis worsened on resuming the diet (3).

Gluten-sensitive enteropathy commonly manifests with minimal or no gastrointestinal symptoms and there is association between latent gluten sensitivity and psoriasis (7,8). Gluten-free diet improves severity of psoriasis in patients who are positive for anti tissue transglutaminase IgA (anti tTG IgA), anti gliadian IgA and/or IgG even though no celiac disease (CD) clinically exist (3). Gluten sensitivity can be measured by the antibodies against the prolamin component of gluten (9) or antibodies against tTG–gliadin complex (10). There is a strong association of psoriasis with expression of HLA Cw6 (11,12). The aim of this study was to see the serological expression of CD-associated anti gliadin

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IgA, anti gliadin IgG, and anti tTG IgA in serum of patients with psoriasis and to see the correlation in expression of these antibodies with HLA Cw6 antigen in patients with psoriasis.

MATERIALS AND METHODS

Study subject comprised 56 patients with psoriasis from the patient clinic, Department of Dermatology and Venereology and 60 healthy controls (HC) who had no present or past history of any autoimmune, systemic, skin, or gastric disorder. Patients with psoriasis who had not received any previous local or systemic treatment within 3 months were included in the study. Serum anti tTG IgA and anti gliadin IgA/IgG were assayed using indirect noncompetitive enzyme immunoassay kit of Varelisa, Pharmacia Diagnostics, Germany. Antisera used for HLA Cw6 typing was of BAG Company, Germany

Anti gliadin IgA/IgG value above 17 U/ml was taken as positive. Recombinant human tTG antigen was used in anti tTG IgA ELISA kit. Anti tTG IgA value above 8 U/ml was taken as positive. The values of patients' samples were calculated using the standard graph plotted using the five calibrator values. Typing for HLA Cw6 antigen was performed by complement mediated micro-cytotoxicity method of Terasaki and McClelland (13), as described in detail by Mehra 1989 (14).

The study was approved by the ethical committee of the institution, and an informed consent was obtained from all the patients enrolled in the study.

Statistical analysis

All data were analyzed using SPSS 14.0 (SPSS Inc., Chicago, IL) computer statistics program. Values were given as mean $\pm$ standard deviation. Student t test was used to compare mean, Pearson Chi-square was used to compare frequency, and Spearman's rho correlation was used to analyze correlation. P values of less than 0.05 were considered significant for t test and χ^2, whereas P values of less than 0.01 were considered significant for assessment of correlation.

RESULTS

A total of 56 psoriasis patients comprising 33 males and 23 females of mean age 37.1 ± 17.5 (range 5–70) years and 60 HC comprising 43 males and 17 females of mean age 28.7 ± 6.6 (range 19–47) years were included in the study. There was no significant difference in age ($P > 0.05$) and gender ($P = 0.15$) between the patients and HC. Psoriasis patients included 38 cases of plaque psoriasis, 13 cases of palmoplanter, two of psoriatic erythroderma, one of pustular psoriasis, and two of guttate psoriasis. The mean age of disease onset was 28.0 ± 17.1 years and mean duration of disease was 6.3 ± 8.6 years. A total of 19 (33.9%) patients with psoriasis were HLA Cw6 positive, whereas six (10.0%) HC were HLA Cw6 positive. Frequency of HLA Cw6 expression was significantly higher in patients when compared with HC ($P < 0.05$; Table 1).

Mean and range of antibodies in patients with psoriasis and HC are shown in the Table 2. Serum anti gliadin IgA, anti gliadin IgG, and anti tTG IgA were significantly higher in patients with psoriasis than in HC ($P < 0.05$, < 0.05, and 0.01, respectively). A total of 17 patients with psoriasis were positive for any of the three antibodies studied and serum anti gliadin IgA and anti gliadin IgG both antibodies were positive in five patients with psoriasis. There was significant difference ($P = 0.03$) found in expression anti tTG IgA between males (2.6 ± 2.0 U/ml) and females (3.6 ± 2.8 U/ml) included in our study. Females were more likely to develop anti tTG IgA than males. There was significant difference in anti tTG IgA expression with the age of psoriasis patients ($P = 0.01$). Elderly patients have more tendency to develop anti tTG IgA.

Expression of antibodies with HLA Cw6 in patients and HC were shown in Table 3. There was no significant association of HLA Cw6 with expression of antibodies. There was no correlation in of HLA Cw6 with anti

TABLE 1. Characteristics of Patients with Psoriasis and Control

	Patient (56)	Control (60)	P
Age (mean $\pm$ SD)	33.1 ± 17.5 years	28.7 ± 6.6 years	>0.05*
Male, n (%)	33 (58.9)	43 (71.7)	0.15**
Female, n (%)	23 (41.1)	17 (28.3)	
HLA Cw6 positive (%)	19 (33.9)	6 (10.0)	<0.05**
HLA Cw6 negative (%)	37 (66.1)	54 (90.0)	
Age of onset (mean $\pm$ SD)	28.0 ± 17.1 years	–	–
Disease duration (mean $\pm$ SD)	6.3 ± 8.5 years	–	–

*t Test, **χ^2 test.

TABLE 2. Anti gliadin IgA and IgG and Anti tissue transglutaminase IgA in Serum

	Psoriasis		Controls				CI (95%)	
Antibodies (U/ml)	*N*	%	*N*	%	Psoriasis vs control (mean ± SD)	*P*	Lower	Higher
Anti gliadin IgA Ab								
Range	1.5–30 U/ml		1.5–11 U/ml		8.1 ± 7.0			
≤17	48	85.7	60	100	vs			
>17	08	14.3	–	–	2.9 ± 2.4	<0.05*	3.34	7.14
Anti gliadin IgG Ab								
Range	2.0–26 U/ml		1.5–5.5 U/ml		9.1 ± 7.6			
≤17	44	78.6	60	100	vs			
>17	12	21.4	–	–	2.4 ± 0.8	<0.05*	4.66	8.58
Anti tTG IgA								
Range	0.2–10.0 U/ml		0.5–6.0 U/ml		3.7 ± 2.6			
≤8	50	89.3	60	100	vs			
>8	06	10.7	–	–	2.3 ± 1.9	0.01*	0.57	2.20

*$P < 0.05$ significant.

TABLE 3. Expression of Antibodies With HLA Cw6 in Patients With Psoriasis

	HLA Cw6		
Antibody (U/ml)	Positive (%)	Negative (%)	*P*
Anti gliadin IgA			
≤17	16 (28.6)	32 (57.1)	1.00*
>17	3 (5.4)	5 (8.9)	
Anti gliadin IgG			
≤17	13 (23.2)	31 (55.4)	0.30*
>17	6 (10.7)	6 (10.7)	
Anti tTG IgA			
≤8	18 (32.1)	32 (57.1)	0.65*
>8	1 (1.8)	5 (8.9)	

**$P > 0.05$ insignificant.

TABLE 4. Correlation Among Antibodies and HLA Cw6

	Anti gliadn IgA	Anti gliadn IgG	Anti tTG IgA
HLA Cw6			
r	0.06	−0.10	0.14
p	0.66	0.45	0.29
Anti gliadin IgA			
r	–	0.67	0.45
p	–	<0.01*	<0.01*
Anti gliadin IgG			
r	–	–	0.26
p	–	–	<0.01*

*$P < 0.01$ significant.

gliadin IgA or anti gliadin IgG or anti tTG IgA but there were significant correlation among the antibodies (Table 4).

DISCUSSION

Consumption of gluten-containing cereals causes CD in gluten-sensitive individuals (9,15,16). Some studies have also reported reduction in disease severity when the patients are treated with gluten-free diet (3,5,17).

Anti gliadin IgA, IgG and tTG IgA were significantly elevated in our psoriasis patients when compared with HC. CD-associated antibodies were moderately increased indicating the presence of silent CD in psoriasis cases. In our study, 25.0% of cases were positive for anti gliadin IgA or/and IgG, whereas 8.9% cases were anti tTG IgA positive. A slightly lower positivity has been reported in other studies. Michaelsson et al. (18) have reported a positivity of 16.0% for anti gliadin IgA or/and IgG in 302 cases of psoriasis. Only 5.1% positivity for anti gliadin IgG and 2.6% anti tTG IgA has been reported by Cardinali et al. (19) in 39 cases of psoriasis but they did not find anti gliadin IgA in their study group. Another study from United Kingdom has also reported comparatively lower percentage of CD-associated antibodies than our study (8.5% anti gliadin IgA, 3.8% anti gliadin IgG, and 7.7% anti tTG IgA) (5).

A study on 109 cases of psoriatic arthritis reported significantly higher concentration of anti gliadin IgA (17.4%) and IgG (2.8%) than reference group (4). Michaelsson et al. (8) reported elevation in anti gliadin IgA, IgG, and tTG level in involved dermis than in non involved skin, which was significant (5.1 ± 3.8% vs 0.7 ± 0.5%, $P < 0.05$) in 37 cases with psoriasis. Similar to our study Damasiewicz-Bodzek et al (20) have reported significantly higher level of serum anti tTG IgA and anti gliadin IgA levels in 67 psoriasis cases. Contrary to this, Kia et al. (6) estimated IgA and IgG antibodies to gliadin in 100 cases of psoriasis, 100 cases of psoriatic arthritis, and 100 controls. They found no

significant difference in their level among psoriasis, psoriatic arthritis, and control group.

In our study, there was significant correlation among the CD-associated antibodies but no correlation with HLA Cw6, indicating that Cw6 does not have any role in unmasking the antigens for expression of CD-associated antibody or these antibodies have no role in the expression of HLA Cw6 antigen for the development of psoriasis. Studies on CD reported that HLA Cw6 has no significant association with CD (21–23). Our results also suggest that there is some other factor involved for gluten sensitivity or expression of CD-associated antibodies in patients with psoriasis. Psoriasis and CD share some common immune mechanism. Both are T-cell-mediated disease. Psoriasis is T-cell-mediated inflammatory disease of skin (24) and CD is T-cell-mediated gluten-dependent enteropathy characterized by atrophy of intestinal villi (25). Abnormal small intestinal permeability occurs usually in both the diseases. Vitamin D deficiency increase severity of psoriasis as it plays inhibitory role in growth and accelerated maturation of keratinocyte (26,27). Vitamin D deficiency is also found in CD (28),) which may be the cause for inducing or increasing severity of psoriasis in patients with increased level of CD-associated antibodies.

CONCLUSIONS

Our study concludes that CD-associated antibodies are found in patients with psoriasis or CD may develop in patients with psoriasis without any clinical symptom of disease. Our study also suggests that there is some other factor involved for gluten sensitivity or expression of CD-associated antibodies in patients with psoriasis apart from HLA Cw6.

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