Fadia Mahmoud^a
Qasem Alsaleh^d
Habib Abul^b
Hussein Hassab El-Naby^d
Saleh Al Harbi^c

- ^a Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences and Nursing,
^b Department of Pharmacology, and
^c Immunogenetic Laboratory, Faculty of Medicine, Kuwait University, and
^d As'ad Al-Hamad Dermatology Center, Al-Sabah Hospital, Kuwait

Association of Major Histocompatibility Complex with Psoriasis vulgaris in Adult Kuwaitis

Abstract

Objective: The association of the major histocompatibility complex (MHC) with psoriasis vulgaris has been reported in different ethnic groups. However, an identification of human leukocyte antigen (HLA) genes that determine susceptibility to the disease has not been reported previously among the Arabs of the Arabian Peninsula. This study was conducted with the objective of establishing any correlation between psoriasis and the expression of HLA class I and class II in a Kuwaiti population. **Methods:** Expression frequencies of the MHC were measured in 26 Kuwaiti patients with psoriasis, and 60 control individuals were matched for age, sex and ethnic background. Tissue typing for class I and class II antigens was carried out by lymphocytotoxicity assays. **Results:** HLA-CW6, DQ2 and DQ7 were significantly increased in patients compared to controls ($p = 0.0002$, 0.0044 and 0.0004 , respectively), while HLA-B7, DR5 and DR52 were significantly decreased ($p = 0.002$, 0.0004 , 0.019 , respectively). **Conclusion:** These findings suggest that psoriasis is associated with HLA-CW6, DQ2 and DQ7 in the Kuwaiti population. Further studies to investigate the association of distinct HLA with psoriasis vulgaris based on the RNA levels are under way.

Key Words

Human leukocyte antigen
Psoriasis
Susceptible genes

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Dr. Fadia Mahmoud
Department of Medical Laboratory Sciences
Faculty of Allied Health Sciences and Nursing
Kuwait University, PO Box 24923
13110 Safat (Kuwait)

Introduction

Psoriasis vulgaris is a disease of unknown etiology characterized by an increase in the turnover of epidermal cells and defective keratinization. Association between human leukocyte antigens (HLAs) and psoriasis has been reported in various ethnic groups [1–3]. Russell et al. [4] first reported the association of psoriasis with B13 and B17 in 1972. Since then, association with other HLAs such as A1, B13, B17, B37, CW4, CW6, CW11 and DR7 and others has been reported [5–7]. The strongest correlation was found between psoriasis vulgaris and HLA-C, specifically CW6 [6–9].

The identification of HLA genes that determine susceptibility to the development of psoriasis vulgaris may be of prognostic value. Therefore, we studied the frequency distribution of HLA class I and class II in Kuwaiti psoriatic patients.

Patients and Methods

The study patients consisted of 26 subjects (12 males and 14 females) with psoriasis vulgaris (chronic generalized discoid type). The patients were newly diagnosed at the As’ad Al-Hamad Dermatology Center, Al-Sabah Hospital, Kuwait, and the selection was random. As controls, 60 healthy subjects who matched the patients in age and sex were incorporated in this study.

Tissue typing for class I and class II antigens was carried out by the standard complement-mediated lymphocytotoxicity assay recommended by the NIH, USA. HLA sera were purchased from Biotest, Dreieich, Germany.

Statistics

Statistical analysis was performed by the standard Pearson’s χ^2 test with Yates’ correction for continuity. Fisher’s exact test (two-tailed) replaced the χ^2 test if the expected frequency of an antigen was less than 5. The strength of association was estimated by the relative risk (RR) according to Wolf’s formula [10].

Results and Discussion

The results, summarized in table 1, showed a significant increase in the following antigens in patients when compared to con-

Table 1. HLA frequency in psoriasis patients (n = 26) and controls (n = 60)

Antigen	Psoriasis		Control		Statistical analysis	p (corrected)	RR
	n	%	n	%			
B7	0	0	16	26.7	Fisher’s exact two-tailed test	0.002	–
CW6	9	34.6	2	3.3	Fisher’s exact two-tailed test	0.0002	15.4
DR5	0	0	24	40	Pearson’s χ^2 test 12.5	0.0004	–
DR52	11	42.3	43	71.7	Pearson’s χ^2 test 5.5	0.0190	0.29
DQ2	15	57.7	14	23.3	Pearson’s χ^2 test 8.1	0.0044	4.5
DQ7	6	23.1	0	0	Fisher’s exact two-tailed test	0.0004	–

trols: HLA-CW6, DQ2 and DQ7 ($p = 0.0002$, 0.0044 and 0.0004 , respectively). In contrast, HLA-B7 and DR5 were absent and DR52 showed lower expression in patients when compared to controls ($p = 0.002$, 0.0004 and 0.019 , respectively). A high RR was shown with CW6 and DQ2 ($RR = 15.4$ and 4.5 , respectively).

The association between psoriasis and HLAs has been reported in several ethnic groups [1–3]. The strongest association was with CW6 [6–9]. An increased frequency of A1 was reported in Asian populations [6, 11, 12]. HLA-A1, B17, BW56, CW6 and DR7 were increased in psoriatic Indians [5, 13], while in Japanese CW4, CW7 and CW11 were reported to be associated with the disease [7, 12]. In Jewish patients, a significantly increased frequency of HLA-CW6 and CW7 was observed [3], whereas an increase in B17,

CW6 and DR6 was reported in Italian infantile psoriatics [14].

Our results show a significant increase in CW6 ($p = 0.0002$), which is consistent with other studies [6, 9]; however, the increased expression of DQ2 and DQ7 has not been described in other ethnic groups. The study established a high risk of psoriasis associated with an increased frequency of CW6, DQ2 and DQ7 ($RR = 15.4$ and 4.5 for CW6 and DQ2, respectively), which suggests that these alleles are susceptibility genes for psoriasis in Kuwaitis. On the other hand, the low expression of DR52 in patients compared to controls ($p = 0.019$) and the absence of B7 and DR5 in psoriatic patients suggest their protective role in normal individuals. Further studies demonstrating the association of distinct HLAs with psoriasis vulgaris based on the RNA level are under way.

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