caused by unsaturated polyesters has been reported.

Probably, the whole molecular structure of polyester methacrylate acts as an allergen, since none of the animals reacted when tested with methyl methacrylate or methacrylate. However, the reactive terminal methacrylate groups seem to be of great importance for antigen formation and sensitization.

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HLA Antigens in Discoid Lupus Erythematosus

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Abstract. HLA-A, B, C and Bf typing was performed in 55 cases of Discoid Lupus Erythematosus (DLE). When both the sex and age of the patient at the onset of the disease were taken into consideration (group I under 40 years, group II over 40), the following increases in antigen frequency were observed: group I: A2 in women, B5, A10 in men; group II: Aw19.2 in women, B8 in both sexes. Nevertheless, if the probability is multiplied by the number of antigens tested, these results are no longer significant.

Key words: Discoid Lupus Erythematosus; HLA typing

In 1977 Millard et al. (5) investigated 69 cases of Discoid Lupus Erythematosus (DLE). HLA typing showed an increased frequency of HLA-B7, B8 and Bw35 antigens related to the sex of the patient and the age of onset of the disease. In order to compare our results with those of these authors, 55 cases of DLE were studied.

PATIENTS AND METHODS

Fifty-five patients with DLE, 33 men and 22 women, were typed for HLA-A, B, C and Bf antigens. When the age of onset of the disease was studied, the patients could be divided into two groups: (i)—group I with 23 cases, 22 of then aged between 20 and 35 years and 1 case aged 3; (ii)—group II with 32 cases aged between 41 and 67 years.

Classification of patients according to their sex was as follows. Group I: 15 men and 8 women; group II: 18 men and 14 women. Patients were selected as follows (*a*) clinical diagnosis by a dermatologist; (*b*) confirmation by biopsy examined in the same histology laboratory.

The following HLA antigens were investigated HLA-A1, A2, A3, A9, A10, A11, Aw19.2 (Aw30+Aw31), A28, A29, Aw32, Aw33; HLA-B5, B7, B8, B12, B13, B14, B15, Bw16, B17, B18, Bw21, Bw22, B27, Bw35, B37, B40; HLA-Cw2, Cw4, Cw5. Bf phenotyping was performed by

Table I. *HLA antigen frequency in terms of sex and age of onset of DLE*

	Female patients and controls						Male patients and controls					
	Under 40 years			Over 40 years			Under 40 years			Over 40 years		
	Patients (8) (%)	Controls (136) (%)		Patients (14) (%)	Controls (63) (%)		Patients (15) (%)	Controls (132) (%)		Patients (18) (%)	Controls (98) (%)	
A1							0	31	$p=0.01$			
A2	100	45	$p=0.005$	21	50	$p=0.1$						
A10							33	9	$p=0.04$			
Aw19.2				28	3	$p<0.02$						
B5							40	12	$p=0.03$			
B8				42	14	$p=.04$				44	20	$p=0.06$
Bf S0.7							13	0.86	$p=0.06$			
Bf F1				14	1	NS						

high voltage gel electrophoresis of serum samples followed by immunofixation (1).

HLA and Bf antigen frequency in the patients were compared with that of a control population of 463 blood donors from the same area. Statistical analysis was carried out by the χ^2-test using Yates' correction when necessary. Only results with a probability ≤ 0.05 were considered statistically significant; results with a probability near this limit are mentioned in the table only as an indication.

RESULTS

Comparison of HLA antigen frequency in patients vis-à-vis controls was first carried out between the whole patient population and the whole control population. Only a slightly significant increase in the frequency of HLA-Aw19.2, HLA-B8 and Bf S0.7 was observed in the patients.

A comparison of antigen frequency according to the sex of the patients vis-à-vis controls of the same sex showed only slightly significant or non-significant differences.

Significant differences, on the contrary, were observed when patients in groups I and II were compared with controls of the same age. Here an increase in the frequency of HLA-A2 ($p<0.005$) and HLA-B5 ($p<0.04$) in group I patients and of HLA-B8 ($p<0.005$) and HLA-Aw19.2 ($p<0.06$) in group II patients was observed.

Results taking both the sex and age at onset of the disease into account are shown in Table I. This subdivision caused an immediate reduction in the number of patients who could be studied in each category. Results should therefore be interpreted with reservation. Nevertheless, in group I, there was a definite increase in HLA-A2 in women ($p=0.005$) but not in men. In the latter, HLA-B5, HLA-A10 and Bf S0.7 antigens were increased, while HLA-A1 was absent. In group II the most significant frequency increases were seen in antigen HLA-Aw19.2 and HLA-B8 in women, and in antigen HLA-B8 alone in men. However, if the probability (p) is multiplied by the number of antigens examined, as recommended by Svejgaard et al. (12), the results are no longer significant.

Since HLA-B8 is often, through linkage disequilibrium, associated with HLA-A1 and Bf S, the phenotypes of the 15 HLA-B8 patients and the 76 HLA-B8 controls were checked. Only 9 of the 15 HLA-B8 patients were also HLA-A1 (60%) whereas 60 of the 76 HLA-B8 controls were HLA-A1 (79%). Again, 14 of the 15 HLA-B8 patients were Bf S (93.3%), while 66 of 70 HLA-B8 controls tested for Bf were Bf S (94.3%).

DISCUSSION

Analysis of the results, both when all DLE patients were compared with controls from the same area as well as when the sex of the patient was taken into account, showed the results to be either non-significant or at the limit of significance if a probability of $p \leq 0.05$ is taken as the limit.

By contrast, a study carried out in relation to the age at onset of the disease and the sex of the patient showed that the women in group I were often HLA-A2 ($p=0.005$) whereas the men in this group were often HLA-B5 ($p=0.03$) or HLA-A10 ($p=0.04$). In group II, the increase in HLA-B8 was

found in both men and women (42.8% of women, 44.4% of men were B8 in group II). The slight increase in HLA-Aw19.2 in group II was due to an increased frequency of this antigen in the women ($p<0.02$).

The increase in HLA-B8 observed in group II led to investigation of antigens in linkage disequilibrium with HLA-B8 (i.e. HLA-A1 and Bf S). Unfortunately only the phenotypes and not the genotypes of the patients were available. However, the frequency of the simultaneous occurrence, on the one hand of HLA-A1 and HLA-B8 and on the other of Bf S and HLA-B8 in the patients vis-à-vis the controls were investigated. The results showed that only 60% of HLA-B8 patients were HLA-A1, vs. 79% of the controls, whereas 93.3% of the patients were Bf S, vs. 94.3% of the controls. Thus the increased frequency of HLA-B8 in group II seemed to be linked to the HLA-B8 Bf S region rather than to the HLA-A1 B8 region. Hence the gene of susceptibility to the disease, if it exists, could, in group II, be sited nearer locus B than locus A. By contrast, in group I the more definite association with the antigen HLA-A2 would suggest that, in this age group, the disease is linked to a gene of susceptibility sited near locus A. The findings give further support to Burch & Rowell (2) who think there are at least three different genomes governing the different ages of onset of the disease.

It should also be noted that the increased frequency of antigens demonstrated in DLE has also been observed in Systemic Lupus Erythematosus (SLE). This is the case principally for HLA-B8 (3, 4, 7, 10) but also for the HLA-B5 antigen (6, 11), HLA-A2 (7), HLA-Aw19.2 and particularly for Aw30 in Japanese people (8). Comparison of results obtained by different authors studying a given disease is not easy, as the number of cases examined and their ethnic origin usually differ. It is even more difficult and great care must be taken when the comparison is made between two diseases such as DLE and SLE. Although other authors have reported, in SLE, an increase in the frequency of antigens other than those given here (HLA-B15, HLA-B7, HLA-B13, HLA-Bw35), it is nevertheless surprising to find that the increase in the frequency of antigens we demonstrated in DLE has been reported in SLE by other investigators. These findings may aid support to the theory of 'ethiopathogenic' unity of a least a part of DLE and SLE (4).

The determination of locus DR antigen sited after locus B may clarify this subject. Already preliminary studies on DLE patients have shown that HLA-DR 2, and DR 3 in linkage disequilibrium with HLA-B8, occurs more frequently in SLE patients than in controls (3, 9, 10). HLA-DR typing of DLE patients would be an additional means of comparing SLE and DLE.

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