extent in bone osteoclasts. In our patients, who had apathetic hyperthyroidism with low concentrations of serum magnesium and high ones of alkaline phosphatase which reverted to normal after three months' treatment, the interesting aspect is the possible role of hypomagnesaemia in producing this type of hyperthyroidism.

[1] Lahey, F H, *Annals of Internal Medicine*, 1932, **5**, 1123.
[2] Fairclough, P O, and Besser, G M, *British Medical Journal*, 1973, **1**, 364.
[3] Lehninger, A L, *Biochemistry, The Molecular Basis of Cell Structure and Function*, 2nd edn, p 825. New York, Worth, 1975.
[4] Neguib, M A, *Lancet*, 1963, **1**, 1405.

(*Accepted 8 December 1977*)

Westminster Hospital, London SW1
PETER MARKS, MB, MRCP, senior research registrar
HASHMAT ASHRAF, MB, FRCS, surgical registrar

Association between HLA-BW40 and alcoholic liver disease with cirrhosis

Some alcoholics seem to develop cirrhosis more readily than others, and the influence of genetic and environmental factors on individual susceptibility has been discussed.[1] Autoimmune mechanisms have also been implicated, since an increased prevalence of autoantibodies and evidence of cell-mediated immunity to liver tissue have been reported in patients with cirrhosis,[2-4] particularly in women.[2]

Bailey *et al*[4] performed HLA typing on their patients with alcoholic liver disease and found an increased prevalence of HLA-B8. This is a known trait in several autoimmune disorders and has also been shown in chronic active hepatitis. Scott *et al*[5], however, could find no association between any HLA antigen and chronic active hepatitis or alcoholic cirrhosis. We report here the results of HLA typing in patients with alcoholic liver disease.

Patients, methods, and results

Forty-one patients with alcoholic liver disease were studied. Twenty-five patients (aged 37-74 years (mean 58); 8 women, 17 men) had cirrhosis. All of these patients had undergone liver biopsy and the diagnosis was based on clinical, biochemical, and histological criteria. Nine of the 25 also had the histological features of alcoholic hepatitis. The other 16 patients (aged 39-75 years (mean 56); 3 women, 13 men) had no evidence of cirrhosis on liver biopsy: four had alcoholic hepatitis, and 12 had fatty liver disease. Another 16 patients with different liver diseases also underwent HLA typing. Four had chronic persistent hepatitis, three had hepatitis B, two had hepatitis A, and three had minimal biochemical evidence of hepatic disease of unknown origin. Four patients were classified as having non-alcoholic cirrhosis. HLA typing was performed by recommended microcytotoxic techniques. Fifty-four typing sera were used, typing for 20 antigens. Three anti-HLA-BW40 sera were used. All patients were typed blind. The control samples were from blood donors in Oslo. Controls and patients were typed within the same period using the same set of typing sera. χ^2 values were calculated by two-by-two tables for each comparison separately.

The table shows all the antigens typed for, and the number of subjects positive for each. When computing the χ^2 value for each comparison (60 in all) we found only one significant deviation from the normal distribution. Thirteen of the 25 patients (52%) with alcoholic liver disease and cirrhosis were HLA-BW40 positive compared with 28 of the 153 (18%) controls ($\chi^2 = 13{\cdot}77$, 11·93 with Yates's correction; $P < 0{\cdot}001$; when multiplied with the number of antigens tested for (20), $P < 0{\cdot}02$). The prevalence of HLA-BW40 was not increased in the two other groups of patients, and the prevalence in the control group was the same as that in the Norwegian population. The prevalence of HLA-B8 did not differ significantly from normal in any group. Bailey *et al*[4] noted an absence of HLA-A28 in both types of alcoholic liver disease, which we also found, but our groups were too small to yield statistically significant results.

Prevalence of HLA antigens in three groups of patients. Results are numbers of subjects positive for each antigen

HLA	Patients with: Alcoholic liver disease and cirrhosis (n = 25)	Alcoholic liver disease without cirrhosis (n = 16)	Other liver disease (n = 16)	Healthy controls (n = 153)
A1	8	5	2	40
A2	15	12	11	80
A3	5	2	3	36
A9	5	2	5	37
A10	3	2	1	13
A11	1	3	0	15
A28	0	0	1	8 (+1 ?)*
B5	4	0	1	9
B7	5	2	4	41
B8	4 (16%)	4 (25%)	5 (31%)	31 (20%)
B12	6	6	1	58
B13	4	0	0	3
B14	1	1	0	2
BW15	3	4	3	30
B17	2	0	1	8
B21	1	1	1	4
B27	0	5	5	15
BW35	3	4	2	23
BW37	1	0	0	2
BW40	13 (52%)	3 (19%)	3 (19%)	28 (18%)

*Anti-HLA-A28 cross-reacted with HLA-A2. One of the controls might therefore have been A2 homozygous, A2, A "blank," or A2, A28.

Comment

Many associations have been shown between HLA antigens and different diseases—mostly chronic diseases of uncertain cause and sometimes with immunological manifestations. Even if excessive consumption of alcohol is the main agent in the development of alcoholic cirrhosis, its cause is still uncertain, since we do not know why only some heavy drinkers develop cirrhosis. The association with HLA-BW40 may support the idea that individual susceptibility to the development of alcoholic cirrhosis is genetically determined.

We know of no previous reports of an association between liver disease and HLA-BW40. Scott *et al* did not find an increased prevalence of HLA-BW40 among 18 patients with alcoholic cirrhosis,[5] and Bailey *et al*[4] did not type for HLA-BW40. We were not able to confirm the findings of Bailey *et al*[4] of an excess of HLA-B8 among patients with alcoholic liver disease, which suggested that alcoholic disease might belong to the group of autoimmune diseases, in which several associations with HLA-B8 have been shown.

[1] Klatskin, G, *Gastroenterology*, 1961, **41**, 443.
[2] Krasner, N, *et al*, *British Medical Journal*, 1977, **1**, 1497.
[3] Mihas, A A, Bull, D M, and Davidson, C S, *Lancet*, 1975, **1**, 951.
[4] Bailey, R J, *et al*, *British Medical Journal*, 1976, **2**, 727.
[5] Scott, B B, *et al*, *Gastroenterology*, 1977, **72**, 122.

(*Accepted 24 November 1977*)

Krohgstøtten Department of Oslo City Hospital, Oslo 1, Norway
H BELL, MD, university lecturer

Department of Immunology, National Blood Group Reference Laboratory and Tissue Typing Unit, National Institute of Public Health, Postuttak Oslo 1, Norway
R NORDHAGEN, MD, deputy director

Intracellular potassium after magnesium infusion

Potassium loss in the urine is a well-known side effect of treatment with most diuretics, and usually potassium supplements are provided to avoid this. During the last few years interest has focused on the increased renal excretion of magnesium resulting from the use of most diuretics.[1] A sustained increase in magnesium excretion may lead to a cellular magnesium deficiency, which by an insufficient activation of Na-K-ATP-ase may result in the inability of the cell to maintain the high intracellular potassium concentration. Thus the cell fails to attract potassium despite an abundant supply, as shown also in animal studies.[2] As the resting membrane potential is mainly a function of the logarithmic ratio between the intracellular and extracellular potassium, a change in only one of these factors results in a change in membrane potential: thus a decrease in intracellular potassium will lead to a less negative potential. In this way the resting membrane potential approaches the threshold potential and the cell becomes more excitable.