A CAT-scan performed six days after the first symptoms disclosed areas of decreased attenuation with a remarkable specific localisation to the putamens. It is tempting to suggest that the transient difficulties in articulation and swallowing, as well as the pyramidal tract symptoms, were due to the influence of oedema on corticobulbar and corticospinal fibres adjacent to the putamen.

The CAT-scan finding (figure) is of special interest in relation to the neuropathological findings in fatal cases of methanol intoxication.¹⁻⁴ Orthner³ found symmetrical areas of necrosis in the putamens in 41 of 42 deaths from methanol. Thus the present case suggests that methanol intoxication should be seriously considered when a CAT-scan shows bilateral low-attenuating areas in the putamens.

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HLA and thyrotoxic periodic paralysis

Periodic paralysis is a well-known complication of thyrotoxicosis, especially in Chinese and Japanese patients.¹ The precise aetiology of this condition remains unknown and there are few reports of its familial occurrence.² The objective of the present study was to seek a genetic marker, by human-leucocyte-antigen (HLA) typing, in patients with thyrotoxic periodic paralysis (TPP).

Patients, methods, and results

Twenty-one unrelated Chinese men with Graves's disease, complicated by TPP, were studied. HLA typing was also performed in a control group of 26 Chinese men with Graves's disease who did not have TPP. The patients in the latter group had been followed up for at least two years after the initial diagnosis of thyrotoxicosis and it was unlikely that any of them would develop TPP at a later stage,¹ although this could not be excluded completely. A normal control group comprising 238 unrelated Chinese subjects was also studied. Clinical thyroid state and thyroid functions were assessed as described.³ HLA typing was performed by the NIH lymphocyte microcytotoxicity method using a total of 196 locus A and B antisera. The details of the antisera used in our laboratory, particularly for BW46 and B40, have been presented elsewhere.^{4,5}

The HLA antigen and gene frequencies of the patients and of the normal controls are shown in the table. The high frequency of BW46 and BW46/B40 in Chinese patients with Graves's disease⁶ was also reflected in this group of patients, with and without TPP. The joint occurrence of BW46/B40 was found in six of the 21 patients with TPP compared with seven of the 238 normal controls ($\chi^2=26.6$, $P<0.0001$, relative risk, $RR=13.2$). In the 26 patients without TPP, six had the BW46/B40 antigens ($\chi^2=20.3$, $P<0.0001$, $RR=9.9$).

Among the patients with TPP, BW22 appeared to be in linkage disequilibrium with A2 ($\Delta=0.063$), and B17 with AW19 ($\Delta=0.064$). These delta values were higher than that in the normal population (A2 BW22=0.011; AW19 B17=0.023). In four families studied in whom the appropriate antigens were present, A2 BW22 and AW19 B17 existed as haplotypes. A2 BW22 occurred in five of the 21 patients with TPP compared with none in the patients without TPP; 12 of the 238 normal subjects had this combination. The difference between the TPP and the non-TPP group and the difference between the TPP group and the normals were significant ($P<0.01$ and <0.001 , respectively). Although AW19 B17 was seen only in patients with TPP (3/21) and not in the patients without TPP, this difference just failed to achieve statistical significance ($P>0.05$).

HLA antigen and gene frequencies in Chinese male thyrotoxic patients (with and without periodic paralysis) and normal controls

	Men with thyrotoxicosis				Normal (n = 238)		
	With periodic paralysis (n = 21)		Without periodic paralysis (n = 26)		No	Af	Gf
	No	Af	No	Af	No	Af	Gf
A1	0	0	0	0	0	0	0
A2	12	0.571	16	0.615	126	0.529	0.314
A3	0	0	2	0.077	1	0.004	0.002
A9	5	0.238	6	0.231	65	0.273	0.147
A10	1	0.048	0	0	12	0.050	0.025
A11	14	0.667	17	0.654	144	0.605	0.372
A28	0	0	0	0	1	0.004	0.002
A29	0	0	0	0	3	0.013	0.007
AW19	4	0.190	1	0.038	49	0.206	0.109
BLANK							0.022
							1.000
B5	2	0.095	2	0.077	30	0.126	0.065
B7	0	0	0	0	4	0.017	0.009
B8	0	0	0	0	1	0.004	0.002
B12	0	0	0	0	8	0.034	0.017
B13	1	0.048	6	0.231	48	0.202	0.107
B14	0	0	0	0	0	0	0
B15	2	0.095	1	0.038	53	0.223	0.119
B17	4	0.190	2	0.077	34	0.143	0.074
B18	0	0	0	0	4	0.017	0.009
B27	2	0.095	0	0	17	0.071	0.036
B37	0	0	0	0	1	0.004	0.002
B40	8	0.381	10	0.385	98	0.412	0.233
BW16	2	0.095	5	0.192	26	0.109	0.056
BW21	0	0	0	0	0	0	0
BW22	6	0.286	1	0.038	29	0.122	0.063
BW35	0	0	2	0.077	12	0.050	0.025
BW46	12	0.571	17	0.654	54	0.227	0.121
BLANK							0.062
							1.000

Af = Antigen frequency. Gf = Gene frequency.

Comment

Our results show that Chinese patients with TPP had HLA antigens (BW46, BW46/B40) which were common to Chinese patients with Graves's disease as a group.⁵ Nevertheless, in the patients with TPP there were HLA antigens (namely, A2 BW22 and AW19 B17) which were not present in the patients without TPP. These antigens were also not associated with the overall group of Chinese patients with thyrotoxicosis studied previously.⁵ This raises the possibility that these haplotypes may serve as genetic markers for the periodic paralysis, and this would lend support to the hypothesis of a genetic basis for TPP.

It remains to be seen whether all Chinese men with thyrotoxicosis with the HLA antigens of A2 BW22 and AW19 B17 would eventually develop TPP and whether a paralytic attack could be precipitated as, for example, by giving a high-carbohydrate diet or insulin and glucose to those with no clinical history. We have no data on the HLA antigen profile of Chinese patients with non-thyrotoxic familial periodic paralysis for comparative study.

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