On three separate occasions he has been admitted to hospital as an emergency semicomatose in atrial fibrillation confirmed electrocardiographically. Semicoma lasted 1-4 hours, drowsiness up to 20 hours, followed by headache and spontaneous reversion to sinus rhythm. On other occasions he has had similar attacks at home but neither he nor his wife have noticed his pulse irregular at any time.

Apart from mild high tone deafness, the results of investigations including skull x-ray films, lumbar puncture, left carotid angiogram, chest x-ray film, and protein bound iodine concentration were all normal as was his ECG between attacks. An EEG was reported as showing right-sided slow and sharp waves over the parietal occipital areas.

Treatment at intervals with digoxin, phenytoin, clonidine, amitriptyline, and psychotherapy did not alter the frequency or the nature of the attacks.

Comment

Our patient satisfies the symptoms of basilar artery migraine, as outlined by Bickerstaff.¹ During the migrainous attack he has had three documented episodes of impaired consciousness with atrial fibrillation and no evidence of other precipitating cause for the cardiac arrhythmia. Bickerstaff has speculated that the loss of consciousness in basilar artery migraine may be due to either "epilepsy" or "brain stem ischaemia."^{2,3} Mauk *et al* have shown that stimulation of the reticular activating system in dogs leads to cardiac dysrhythmias including atrial fibrillation.⁴ These dysrhythmias were mediated by the sympathetic nervous system.⁵

We suggest that ischaemia of the reticular activating system due to basilar artery migraine caused both impairment of consciousness and atrial fibrillation. Therefore neither epilepsy nor atrial fibrillation is likely to be the cause of impairment of consciousness in basilar artery migraine and the logical prophylaxis of the atrial fibrillation would be β -sympathetic-blocking drugs.

¹ Bickerstaff, E R, *Lancet*, 1961, **2**, 1057.

² Bickerstaff, E R, *Lancet*, 1961, **1**, 15.

³ Bickerstaff, E R, *Proceedings of the Royal Society of Medicine*, 1961, **55**, 167.

⁴ Mauk, H P, Hockman, C H, and Hoff, E C, *American Heart Journal*, 1964, **68**, 98.

⁵ Hockman, C H, Mauk, H P, and Hoff, E C, *American Heart Journal*, 1966, **71**, 695.

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Familial juvenile-onset diabetes

Both hereditary and environmental factors are thought to be important in the aetiology of classical juvenile-onset diabetes. We describe a family in which both parents were diabetics and three of the five children developed overt diabetes within four months.

Patients, methods, and results

The figure shows the HLA genotypes of the family. Mother developed classical insulin-dependent diabetes in 1967 when aged 35. Father was discovered to have glycosuria at a routine medical examination in 1970 when aged 30. His diabetes was well controlled by glibenclamide 5 mg daily. Both parents had diabetic mothers.

Sib 1—The eldest son, aged 12, was found to have glycosuria in September 1974. Insulin treatment was started three weeks later.

Sib 3—This 10-year-old boy was found to have a trace of glycosuria in August 1974 at the time of his sister's diagnosis. In October he had an illness with severe chest pain, which was identified as Bornholm disease. Diabetes was diagnosed a month later after three weeks of classical symptoms and he was given immediate insulin treatment.

Sib 4—The 9-year-old sister was diagnosed in August 1974 as a case of insulin-dependent diabetes after six months of nocturnal enuresis. Mother had found heavy glycosuria in May but had ignored it as the child appeared to be well.

Sibs 2 and 5 had no diabetic symptoms.

Samples of serum obtained in December 1974 from the three diabetic sibs

HLA genotypes of family and dates of confirmation of diagnosis. Black symbols represent patients with diabetes.

were tested for islet-cell antibodies (ICAs) and antibodies to Coxsackie virus types B1-5, mumps, cytomegalovirus, and *Mycoplasma pneumoniae*. No ICAs were found. Sib 3 had high antibody titres to Coxsackie virus types B1 (1/1024) and B5 (1/256), which were consistent with the recent episode of Bornholm disease. Sib 4 had a low antibody titre to Coxsackie B2 (1/32).

The family was re-examined in April 1975, and HLA typing was carried out. Serum samples from all members of the family again contained no ICAs. Standard oral glucose tolerance tests were performed on the two apparently normal sibs with the following results. Blood glucose concentrations at 0, 30, 60, and 120 minutes were 3.7, 5.2, 7.1, and 5.5 mmol/l (66.7, 93.7, 127.9, and 99.1 mg/100 ml) in sib 2; and 3.0, 4.7, 7.6, and 6.4 mmol/l (54.1, 84.7, 137.0, and 115.3 mg/100 ml) in sib 5. Serum insulin concentrations in sib 2 were 4, 21, 45, and 31 μ U/ml at 0, 30, 60, and 120 minutes; and in sib 5, 4, 4, and 10 μ U/ml at 0, 30, and 120 minutes. Both sets of results were slightly abnormal. The two-hour blood glucose concentration in sib 5 was more than twice the fasting value, and this was associated with a poor insulin response. The insulin response in sib 2 was delayed and prolonged, and again the two-hour blood glucose concentration greatly exceeded the fasting value.

Comment

Inheritance of diabetes over three generations is rare in families of juvenile-onset diabetics.¹ The abnormalities of glucose tolerance and insulin secretion found in the two apparently normal sibs suggested that all the children were in some way affected by the disease. The diagnosis of juvenile diabetes in three members of the family within a short time suggested the presence of a common initiating factor, possibly—in view of the recent Bornholm-like illness in sib 3—of viral origin. Tests for a limited number of viral antibodies did not, however, suggest recent infection by a virus common to all the children. The absence of circulating ICAs, which are present at onset in many juvenile-onset diabetics,² indicated that the diabetes in this family may have been of an unusual kind.

These results support the hypothesis that a complex interplay of genetic and environmental factors may be responsible for juvenile diabetes.

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¹ Tattersall, R B, and Fajans, S S, *Diabetes*, 1975, **24**, 44.

² Lendrum, R, *et al*, *Lancet*, 1976, **2**, 1273.

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