MEDICAL PRACTICE

Hospital Topics

Differential Diagnosis of Transient Amnesia

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British Medical Journal, 1973, 4, 593-596**Summary**

In a group of 39 consecutive patients attending neurological clinics with transient amnesia patients with transient global amnesia formed the largest group; others suffered from epilepsy, migraine, temporal lobe encephalitis, or psychogenic fugues. In most cases the clinical features suggested the aetiology, but an electroencephalogram recorded as soon after the attack as possible may help in distinguishing amnesia due to temporal lobe epilepsy.

Introduction

Though it has long been known that sudden episodes of loss of memory may be due to organic disease, such as epilepsy,¹ migraine,² encephalitis,³ or alcoholism,⁴ it was customary until comparatively recently to regard most patients presenting with an attack of transient amnesia as having had a hysterical fugue.⁵ Interest in the pathogenesis of these attacks was rekindled by Fisher and Adams,^{6,7} who described a syndrome presumed to be due to cerebral vascular disease and distinguished from amnesic attacks of psychogenic origin by its occurrence in middle-aged patients of stable personality; they termed this syndrome transient global amnesia. Since then there have been

many studies of the pathophysiology of isolated memory loss in man, and de Jong⁸ recently reviewed the evidence that it results from damage to both temporal lobes.

The differential diagnosis of transient amnesia remains a clinical problem, however, and in this paper we report the diagnostic clinical features of the various underlying causes of this syndrome in relation to a group of 39 consecutive patients referred to us since 1967. We have used the term transient amnesia to describe an attack of loss of memory of variable severity, usually unassociated with other symptoms, from which complete recovery occurs after a period of minutes to days.

Patients

There were 27 men and 12 women and their ages ranged from 15 to 68 years. These patients formed a selected group in that they were referred to neurological clinics by their general practitioners for diagnosis and management. Many patients with psychogenic amnesia are referred direct to psychiatrists.

Transient Global Amnesia

Of the 39 patients 24 (62%) were thought to be suffering from transient global amnesia (see table). Their ages ranged from 46 to 68 years and two-thirds were men. Fifteen patients had single attacks and the remaining nine had two or more at intervals varying from a few days to 15 years. Some of these patients have been described in detail elsewhere.⁹

Fisher and Adams^{6,7} gave a clear description of the syndrome. Most patients are middle-aged men. The attack begins abruptly with the patient's sudden realization that he has lost his memory. Perception and personal identity remain unaffected, and during the attack many patients ask questions about their whereabouts or what they should be doing. The retrograde amnesia, which may extend for many years, shrinks gradually until after a few minutes or hours it remains only for the period between the

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Patients Referred to Neurological Clinics by their General Practitioners

Diagnosis	No. of Patients	No. of Attacks	Associated Features	E.E.G.
Transient global amnesia ..	24	Usually 1-3	Vascular disease	Helpful if recorded within a few days of attack Usually diagnostic
Amnesia due to epilepsy ..	7	Any number	Temporal lobe seizures. Generalized major seizures	
Amnesia due to migraine ..	2	Variable	Migrainous aura headache	May be helpful
Amnesia due to encephalitis ..	2	Presentation with memory loss	C.S.F. helpful	Usually diagnostic
Psychogenic amnesia ..	4	Variable. Attacks characteristically of long duration	Indifference to attacks during them. Hysterical personality disorder. Periodic depression	Normal

onset and full recovery. There is no memory of events occurring during the attack itself, and in most instances no other abnormalities have been observed. In nine of our patients, however, symptoms and signs consistent with brain-stem ischaemia occurred during an attack. Hence transient global amnesia is probably due to bilateral temporal lobe ischaemia occurring as a consequence of vertebrobasilar disease.⁹

The early reports^{6, 7, 10} described patients who had single attacks and doubt was therefore thrown on the suggestion that the syndrome was due to cerebral vascular disease. Nevertheless, patients with recurrent attacks have been reported on by others.^{11, 12} In common with other workers we have noted that physical exertion or sudden exposure to cold or heat was sometimes associated with the onset of the amnesia.¹³

Diagnosis can be made by recognition of the characteristic clinical features. Fisher and Adams⁷ commented that the attacks tended to occur in patients of stable psychiatric background without evidence of epilepsy, but that in some there was associated vascular disease. The E.E.G. is helpful in some patients, provided that a recording can be made within a few days of an attack. Jaffe and Bender¹⁴ and Tharp¹⁵ described abnormalities in the E.E.G. consisting of a diffuse, non-specific alteration of background activity and an excess of unilateral or bilateral theta and sharp wave activity which resolved in later recordings. These abnormalities, which were found in seven of our patients, provide further support for a vascular cause. The following case is a typical example of a patient with transient global amnesia.

Case 1.—A printer aged 46 was driving home in the evening when he lost his memory. On arriving home he could not recall the events of the day and repeatedly asked the same questions but could not take in what he was told. He was vague and behaved as though slightly drunk. He became apparently normal after two hours but even on the next day he was unable to recall the events of the previous afternoon and evening. Twenty months later while in the bath he lost his memory and subsequently could not remember anything for a period of two hours. He could not remember whether he had had his tea (which he had done before his bath), nor could he recall a friend's visit to the house. He was an obese, plethoric man with a blood pressure of 160/100 mm Hg. There were no other abnormal signs. Investigations, including E.E.G. six weeks after the second episode showed nothing abnormal. Four months after the second attack he had a further, shorter episode of amnesia. He remained well during the next two years.

Epilepsy

Altogether seven cases of epilepsy (18%) presented with episodes of amnesia. The ages of these patients ranged from 18 to 61 years. Two had single attacks and the remainder had two or more at intervals varying between three months and eight years. The attacks lasted from several minutes to five hours. Five of these patients had temporal lobe epilepsy and the other two idiopathic epilepsy. All these patients responded well to anticonvulsants.

Retrograde and postictal amnesia are common features of a grand mal attack but transient amnesia as the sole presenting feature of temporal lobe epilepsy is less commonly recognized, though it may occur in association with other symptoms of a

psychomotor seizure.^{1, 16} An example of temporal lobe epilepsy in which amnesia was the presenting feature is given below.

Case 2.—A 58-year-old woman had two similar attacks of loss of memory in an eight-month period. Before the first one she had been drinking champagne and the second occurred while bathing in the sea. In each attack she suddenly lost her memory for five hours and repeatedly asked where she was and what day it was. In the second attack she had to be helped to dress; and later she asked how she had got dressed. After full awareness she found that she had no memory for the events of the preceding 24 hours, and this persisted. She likened these two episodes to the loss of memory which she had experienced when concussed as a young woman. Each episode of amnesia was followed several days later by sudden loss of consciousness while sitting in a chair preceded by a clutching feeling in her throat. During these attacks she slumped forward and became pale but did not convulse. Results of clinical examination were normal and E.E.G. showed paroxysmal sharp waves and theta activity in the temporal leads, particularly on the right. She was treated with phenytoin and had no further attacks in the following year.

This patient's amnesic attacks were indistinguishable from those described by patients with transient global amnesia. Interestingly one of them occurred while bathing, which has been noted previously in cases of transient global amnesia.¹³ The two episodes of sudden loss of consciousness, however, were clearly epileptic, and this interpretation was supported by the E.E.G. abnormality. In our experience episodes of amnesia in temporal lobe epilepsy are usually shorter than those occurring in transient global amnesia, though prolonged episodes have been described.¹⁶

In the transient amnesia of temporal lobe epilepsy, as in psychogenic amnesia, behaviour may be normal but afterwards the patient is found to have failed to register the events leading up to a clinically apparent seizure. This was clearly described in Jackson's original report.¹ Loss of memory in such cases, however, rarely occurs in isolation. Automatism, depersonalization, and other abnormalities of behaviour frequently occur, and when recognized these features enable distinction to be made from transient global amnesia or from psychogenic amnesia. In one case of idiopathic epilepsy amnesic attacks were a presenting feature.

Case 3.—A boy aged 16 years had three episodes of amnesia without other symptoms in three months and later had a major seizure. An E.E.G. showed a diffuse paroxysmal abnormality consistent with idiopathic epilepsy.

Five of the seven patients had abnormalities on the E.E.G. which were of the kind typically associated with epilepsy. Two patients had normal E.E.G. recordings but in both cases E.E.G. was performed only once and there had been only one attack of loss of memory followed by a typical temporal lobe seizure.

Migraine

Moersch,² Nielsen,¹⁷ and Whitty and Lishman⁸ described episodes of amnesia occurring as a manifestation of migraine. Such cases are rare but diagnosis is not difficult if there are accompanying features of classical migraine. In one of our two cases episodes of amnesia were associated with "footballer's migraine."¹⁸

Case 4.—A student aged 19 gave a five-year history of attacks which at first occurred only while playing football and especially after heading the ball; later they occurred after alcohol and with excitement. Each attack began with paraesthesiae in one hand, gradually spreading up the arm and affecting the same side of the face. A typical migrainous visual aura usually followed, and after about half an hour he developed a throbbing frontal headache, often with nausea and vomiting. After most of the attacks he had a period of amnesia lasting several hours. He would forget where he was and would have to be led home by a friend. During these amnesic periods his speech was slightly slurred and his gait was a little unsteady. Clinical examination and E.E.G. showed nothing abnormal. The attacks became less frequent when he gave up football and alcohol and no other therapy was required. His mother had suffered from similar attacks with a similar aura and amnesia after the headache.

Transient amnesia due to migraine might be expected to be more common in patients with "basilar migraine,"²⁰ since both posterior cerebral circulations could be affected, but we have not observed this association.

Temporal Lobe Encephalitis

Two patients, aged 24 and 38 years, had experienced episodes of amnesia during the course of temporal lobe encephalitis. In both cases the episodes of amnesia were the presenting feature. In encephalitis the underlying abnormality would be expected to be bilateral, and this was so in both of our patients. Each developed a prolonged amnesic state during the course of the illness when both temporal lobes were damaged by the encephalitic process, as shown by the E.E.G. recordings, and later both had attacks of transient amnesia due to temporal lobe seizures.

Case 5.—A woman of 38 years was admitted to hospital because of loss of memory for 48 hours of sudden onset. She had complained of tiredness and morning headache for the previous fortnight and had vomited immediately before the onset of the memory loss. On examination she was febrile, appeared withdrawn, and had no memory for recent events. She could not recall information given her a few minutes previously but she did not confabulate. The left plantar response was extensor. Two days after admission she had three generalized convulsions. She was treated with corticotrophin. Two weeks after admission her memory for recent events was still very poor, but later it gradually improved. The cerebrospinal fluid (C.S.F.), examined on admission, contained 5 lymphocytes/mm³ and 34 mg protein/100 ml. On two subsequent occasions the C.S.F. contained no cells. The titre of complement-fixing antibody to herpes simplex virus rose from 1/10 on the seventh day of the illness to 1/80 on the 44th day and then fell to 1/20 on the 164th day. An E.E.G. recorded on the day after admission showed a mild, generalized abnormality and temporal lobe discharges consistent with a diagnosis of encephalitis. Eleven days later the record was more abnormal but four weeks after admission it was almost normal. She remained well for four months but was then readmitted with a further episode of amnesia, which lasted 48 hours. There was no fever, no abnormal neurological signs were present, and the C.S.F. was normal. An E.E.G. showed right temporal epileptiform discharges. After the attack it was observed that registration and recall for immediate and recent events was normal and the period of amnesia did not shrink. She was treated with anticonvulsants but had a major fit a year later.

We believe that this patient suffered from two forms of amnesia associated with herpes simplex encephalitis. The first, in which there was a prolonged disturbance of both recall and registration, was due to encephalitis,^{3 21} and the second to subsequent temporal lobe epilepsy.

Psychogenic Amnesia

In four patients, aged 33 to 54 years, episodes of transient amnesia occurred as a result of psychogenic factors. All had recurrent attacks lasting from 10 minutes to several days. The attacks occurred at intervals varying from three weeks to many years. A typical case is given below.

Case 6.—A 52-year-old interior decorator was referred because

a few days previously he had set off for work but had suddenly found himself six hours later in Great Yarmouth, more than 100 miles (160 km) away. He had had four similar episodes. The first of these occurred in 1944, when he was aged 26 years, while he was serving with the Royal Navy in Australia. He remembered having a migrainous aura as he was boarding a train in Sydney and then came to himself walking in the suburbs of the city six days later, clean-shaven and wearing strange pyjamas. He had no memory for the events of any of these episodes and was strikingly incurious about them. His wife said that they had all been preceded by a period of weepiness and depression. She had witnessed an episode in which he seemed excited and sobbed and giggled inappropriately, but there was no disturbance of spatial or personal orientation. Sexual relations in the marriage were unsatisfactory and he complained of his wife's frigidity. There was no history of epilepsy. Physical examination and an E.E.G. recorded three weeks after his most recent amnesic attack showed nothing abnormal.

In this case the episodes of amnesia were clearly fugue states. The fugues represented an attempt to escape from the depression and anxiety experienced by the patient in the context of stress, first during military service and later in the face of a frustrated sexual relationship. The history was complicated by migraine, but apart from the first amnesic episode this was temporally unrelated to the attacks of loss of memory.

Psychogenic transient amnesia is usually a conversion symptom occurring in a patient with a hysterical personality disorder. The symptom can usually be related to the stress of overwhelming anxiety or depression. Kennedy and Neville⁵ considered, from an analysis of 74 patients, that the cause was often a simple one, in the form of an escape mechanism. Some of their patients were malingering with the objects of concealing an offence; others were suffering from an intolerable depressive or anxiety state from which temporary escape was secured by a process of inward flight which included loss of memory, loss of identity, loss of orientation, or a combination of these. A similar view of psychogenic amnesia was given by Stengel,²² who pointed out that fugues, particularly those associated with a tendency to wander, are usually associated with depression and result from a conflict of guilt feelings and conscience from which escape has proved impossible. This conflict results in dissociation from reality, and so the fugue is accompanied by amnesia. In patients in whom psychogenic factors predominate the underlying difficulty is often social—for example, marital or financial problems. We have observed similar factors in our cases of psychogenic amnesia.

In previously reported cases of hysterical fugues, and in our four patients, the fugues ended abruptly with a sudden awareness of a long period for which there was no memory. In transient global amnesia, however, the retrograde amnesia gradually shortens, so that when recovery is complete amnesia persists only for the period of the attack itself, during which registration of ongoing events has not occurred. Attacks of psychogenic amnesia may be very prolonged, though one of our patients had a 10-minute attack of loss of memory while driving at a time when he was overwhelmed with anxiety. The attacks are characterized by the patients' indifference to them at the time. Our patients, for example, reported the episodes after they had recovered, and during the episodes observers were often unaware of any abnormality. Patients with organic loss of memory, particularly those with transient global amnesia, complain of their defective memory at the time and repeatedly ask questions which demonstrate its severity.

Comment

We have emphasized that transient amnesia is best regarded as a syndrome for which there are several different causes. In most of our cases the clinical features strongly suggested the aetiology, but in some no cause was immediately evident.

Careful history taking from relatives or observers will often provide the clinical information necessary for diagnosis. In

particular, it is important to obtain a complete history of the onset of the attack and an exact description of the patient's behaviour during it, since afterwards, whatever the cause, there will usually be no abnormalities and the patient will be unable to recollect what has occurred. Nonetheless, differentiation of transient global amnesia and amnesia due to temporal lobe epilepsy may present difficulties even when there is a good account of the attack, and it is in these cases that an E.E.G. recorded as soon as possible after an attack is helpful. No other investigation is likely to yield diagnostic information.

Finally, there are other possible causes of transient amnesia in addition to those illustrated by our cases. Hypoglycaemia should always be excluded. Alcoholism may present as an "alcoholic blackout"²³ and the acute amnesia of Korsakoff's syndrome should be easily recognized by its association with alcoholism or malnutrition, by the confusional or confabulatory state, by the patient's lack of awareness of his memory disorder, and by the presence of peripheral neuropathy or of ocular signs, indicating Wernicke's encephalopathy. An acute, partially reversible amnesia may be a manifestation of clonidine poisoning,²⁴ and we have seen a patient who was amnesic for 48 hours during an allergic encephalopathy due to antitetanus serum. Transient amnesia might be expected to occur as an epileptic event in patients with temporal lobe tumours, but we have not encountered this²⁵ and it must be uncommon, perhaps because in such patients the functional disturbance is limited to one temporal lobe.

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Occasional Survey

Four Years' Experience with Indwelling Silastic Cannulae for Long-Term Peritoneal Dialysis

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Summary

Indwelling silicone rubber cannulae have been used for peritoneal dialysis in 41 uraemic patients for periods of up to 46 months. The simplicity of this treatment is particularly suited to patients awaiting transplantation.

Introduction

The difficulty in maintaining safe, comfortable, and long-term access to the peritoneal cavity has been one of the main problems in the management of patients with chronic renal failure by peritoneal dialysis. The Trocath peritoneal catheter designed for short-term dialysis (McGaw, Charles F. Thackray, Leeds) is unsuitable for repeated use as it is uncomfortable and soon becomes loose in its track with resultant fluid leakage, infection,

and peritonitis. Moreover, the mobility of a patient with such a catheter is limited.

To overcome these difficulties multiple puncture techniques have been used with some success, but often have had to be abandoned because of the state of depression related to the discomfort of the treatment.¹ This method increases the chances of eventually puncturing a viscus or important blood vessel and cannot be used unaided by the patient. Peritoneal access with puncturable transcutaneous devices²⁻³ or plastic prostheses to maintain a fibrous track between the skin and peritoneum⁴⁻⁵ have been unsatisfactory in the long term because of leakage of fluid and infection.

The use of a long subcutaneous silicone rubber tube was suggested by Palmer *et al.*,⁶ but in our hands this soon moved freely in its track with the development of subcutaneous abscesses. A similar tube with an expanded silicone area in its middle third which was inserted into the rectus sheath was also unsatisfactory. Two such cannulae disappeared subcutaneously and required operative removal.

A more successful cannula was developed on our unit.⁷ This consisted of a perforated silicone rubber tube with a short Dacron collar which was inserted through an existing sinus track and fixed to the skin by an external reinforcing silastic flange. Though this functioned satisfactorily for periods up to 10 months it was difficult to insert, tended to extrude, and the skin under the flange became macerated.

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