Missed Diagnosis

Epilepsy – another cause of intermittent fever with confusion

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Summary: The problem of recurring episodes of fever and confusion in an 83 year old man was found to be due to epilepsy. He was treated with carbamazepine which abolished the attacks. Epilepsy-induced fever is a difficult diagnosis to make, and electroencephalogram can be invaluable in making the diagnosis.

Introduction

Epilepsy, like syphilis, is a great mimic of medical illness. It may be easily diagnosed, and at the same time, it may baffle even the most astute physician. Epilepsy can mimic stroke,¹ hypomania,² acute abdomen,³ acute respiratory distress from laryngospasm,⁴ cardiovascular collapse from acute bradycardia,⁵ and in our patient an infection.

Seizures as a cause of fever is a diagnosis that physicians are reluctant to make, and rightly so, because of its rarity, and the grave consequences if it is wrong. This case, as with other reported cases,^{6–8} shows the value of electroencephalogram (EEG) in establishing the diagnosis.

Case report

An 83 year old man was admitted with a 24-hour history of fever and confusion. He was admitted two years previously with right hemiparesis, fever and confusion, from which he recovered completely within 48 hours. The hemiparesis was attributed to left cerebral infarction. He was admitted again one year later with fever and confusion, but no definitive diagnosis was made. He recovered rapidly within 24 hours. All investigations were normal, with the exception of an incidental finding of Paget's disease.

On examination, other than a temperature of 38.8°C and a poor abbreviated mental test (AMT) score of one out of ten, no abnormal clinical signs

were detected. Investigations were directed toward establishing the cause of fever and confusion.

All the results were normal, except for an elevated serum alkaline phosphatase from Paget's disease. His white cell count was $6.8 \times 10^9/l$ with normal differential count, ESR was 18 mm/hour, and C reactive protein (CRP) was 6 mg/l. His blood and urine cultures were negative, as were his chest X-ray, isotope brain scans, abdominal ultrasound and barium enema.

Within 24 hours of admission, his temperature subsided and he was less confused. While in the ward, he developed five more episodes of fever and confusion at almost two weekly intervals. Each episode lasted only 24 hours, and all investigations to exclude infection and inflammation were negative. Although antibiotics were given in each of the febrile attacks, it was considered unlikely to be the cause for resolution of fever.

During the last of such an episode, he developed a series of four grand mal seizures just prior to the spike of temperature. Based on the episodic pattern of symptoms, the rate at which symptoms were resolved and the persistently negative investigations, we diagnosed thermal epilepsy and proceeded to start treatment with carbamazepine. An EEG showed an epileptic spike and wave pattern arising on the left side, most prominent anteriorly. A computed tomographic (CT) scan of the brain showed cerebral atrophy with changes of small vessel disease. Since the start of carbamazepine more than three months ago, the episodes of fever and confusion had not recurred. His AMT score had also improved to between 6 and 7.

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Discussion

The problem of fever and confusion in an elderly person can be approached in various ways. Fever from whatever cause can produce confusion secondarily. Likewise, primary causes of confusion (like stroke) may produce fever as a secondary event (from aspiration pneumonia). Hence, both of these symptoms have to be independently investigated. We excluded infection, inflammation and malignancy by extensive blood, urinary and radiological investigations. Subdural haematoma is an important cause of similar changes in the mental state in this age group, though not associated with fever. Alcohol withdrawal was also excluded.

The clue came when the patient had a series of grand mal seizures, which was followed by a rise in temperature within four hours, and which remained elevated for 24 hours before subsiding abruptly. This, together with previous repetition of events, caused us to suspect epilepsy as a possible cause of fever and confusion. On retrospect, he might have had a cerebral infarction two years before, and this left a scar which later became epileptogenic. Alternatively, the episode of right hemiparesis, fever and confusion might have been a seizure attack with Todd's paralysis. The confusion was believed to be either due to complex partial seizures or post-ictal

state. Electroencephalogram can help in establishing a diagnosis, although a normal recording cannot be said to exclude the condition.⁹ The spike and wave pattern on the left side recorded in the EEG adds weight to the possibility of epilepsy when confronted with a presentation such as his.

Seizures produce fever by several mechanisms. Firstly, it could result from excessive heat production due to increased muscular activities during the tonic-clonic phase of the seizure, coupled with inefficient heat loss.^{10,11} Secondly, it may involve a disruption of function of thermoregulatory centre at the pre-optic area of the hypothalamus by electrical impulses originating from an epileptic focus.^{6,12}

This patient highlights the fact that fever does not always imply infection, inflammation or malignancy, even though they are still the most common causes. A detailed history, serial observation, an open mind, EEG and trial of anticonvulsants would all help to make this diagnosis.

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