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Case Report

A change in electrographic activity and blood flow during interictal and postictal psychotic states in a patient with epilepsy

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ABSTRACT

We report a patient with epilepsy who experienced interictal and postictal psychoses. Her psychiatric symptoms consisted of grandiose and fantastic delusions during both psychotic states. During remission, electroencephalography showed bitemporal epileptiform discharges that were predominant in the right temporal region. Epileptiform discharges present during the psychotic states were predominant in the left temporal region. Single-photon emission computed tomography showed hyperperfusion in the left basal ganglia during the interictal psychotic state and hyperperfusion in the right temporal lobe and left basal ganglia during the postictal psychotic state. We suggest that the occurrence of postictal and interictal psychotic states in this patient were associated with a common change in electrographic activity and blood flow.

1. Introduction

Psychoses in patients with epilepsy are classified as interictal psychosis (IIP) or postictal psychosis (PIP). Postictal psychosis develops after complex partial seizures, often secondary generalized tonic–clonic seizures, and often after a cluster of these seizures [1].

Previous studies have described the characteristics of IIP and PIP and suggested a difference in the pathology of these two types of psychosis. Postictal psychosis is associated with elevated mood and religious and grandiose delusions, and patients usually have a lucid interval, i.e., a nonpsychotic period, between the last seizure and the beginning of the psychotic state [1,2]. Psychiatric symptoms of PIP typically remit within 1 week [1]. By contrast, IIP occurs with no direct relation to seizures. The psychiatric symptoms of IIP are mainly auditory hallucinations and delusions of reference, which are similar to the symptoms of schizophrenia. The onset of IIP occurs earlier in the course of the disease than the onset of PIP [3]. In most patients, the psychiatric symptoms of IIP continue for a few months, but, in some patients, they progress chronically.

If psychosis occurs in accordance with an improvement of seizures, it is called alternative psychosis. When electroencephalography (EEG) improves during psychosis, this is called forced normalization [4]. Spikes and slow waves in EEG generally increase during PIP episodes [1]. Most single-photon emission computed tomography (SPECT) studies report hyperperfusion of the frontal and temporal lobes during PIP [5–9], and hyperperfusion of the left temporal lobe during IIP has also been reported [10].

Some patients have both PIP and IIP. Adachi et al. referred to this as bimodal psychoses and described that bimodal psychoses had characteristics similar to those of either PIP or IIP [3]. However, the changes in electrographic activity and blood flow that occur in each psychotic episode are unclear. Here, we investigated EEG and SPECT in a patient with both PIP and IIP episodes.

2. Case report

The patient was a right-handed woman who was first treated at our hospital at the age of 34 years. The patient had encephalitis at the age of 9 years and had epilepsy and mental retardation since this time. The patient has no family history of epileptic or psychiatric disorders. Informed consent was obtained from this patient and her family, and we have omitted information that may reveal the identity of the patient.

At the age of 25 years, the patient experienced her first psychotic episode, during which she said “someone is roasted” and “someone told me that you were a dragon”. It is unclear whether epileptic seizures occurred in the days preceding this episode. Psychotic episodes then recurred and always occurred within a few days of an epileptic seizure or cluster of seizures.

In the lucid interval that occurred in the days following this cluster of seizures, the patient reported insomnia and developed a psychotic state that was characterized by visual and auditory hallucinations, delusions of reference, and grandiose delusions, typified by speaking phrases

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such as “my eyes were stolen” and “someone orders me”. In this period, the patient behaved as if she was a character in an animation. These symptoms persisted for a few days and then disappeared.

The patient consulted our hospital at the age of 34 years for her epileptic seizures and psychiatric symptoms. At this time, she had no psychiatric symptoms. Her habitual seizures consisted of complex partial and secondary generalized tonic–clonic seizures, which were preceded by cephalic sensation. Her seizures tended to occur just before menses and episodically in clusters.

Neurological examination revealed no definite deficit. Interictal scalp EEG showed sporadic sharp waves at F8 and T4 (Fig. 1A) and also at F7 and T3, though rarely. Magnetic resonance imaging showed no definite structural abnormality. The patient was taking valproic acid 800 mg/day (serum concentration = 111.3 μg/ml), clobazam 20 mg/day, nitrazepam

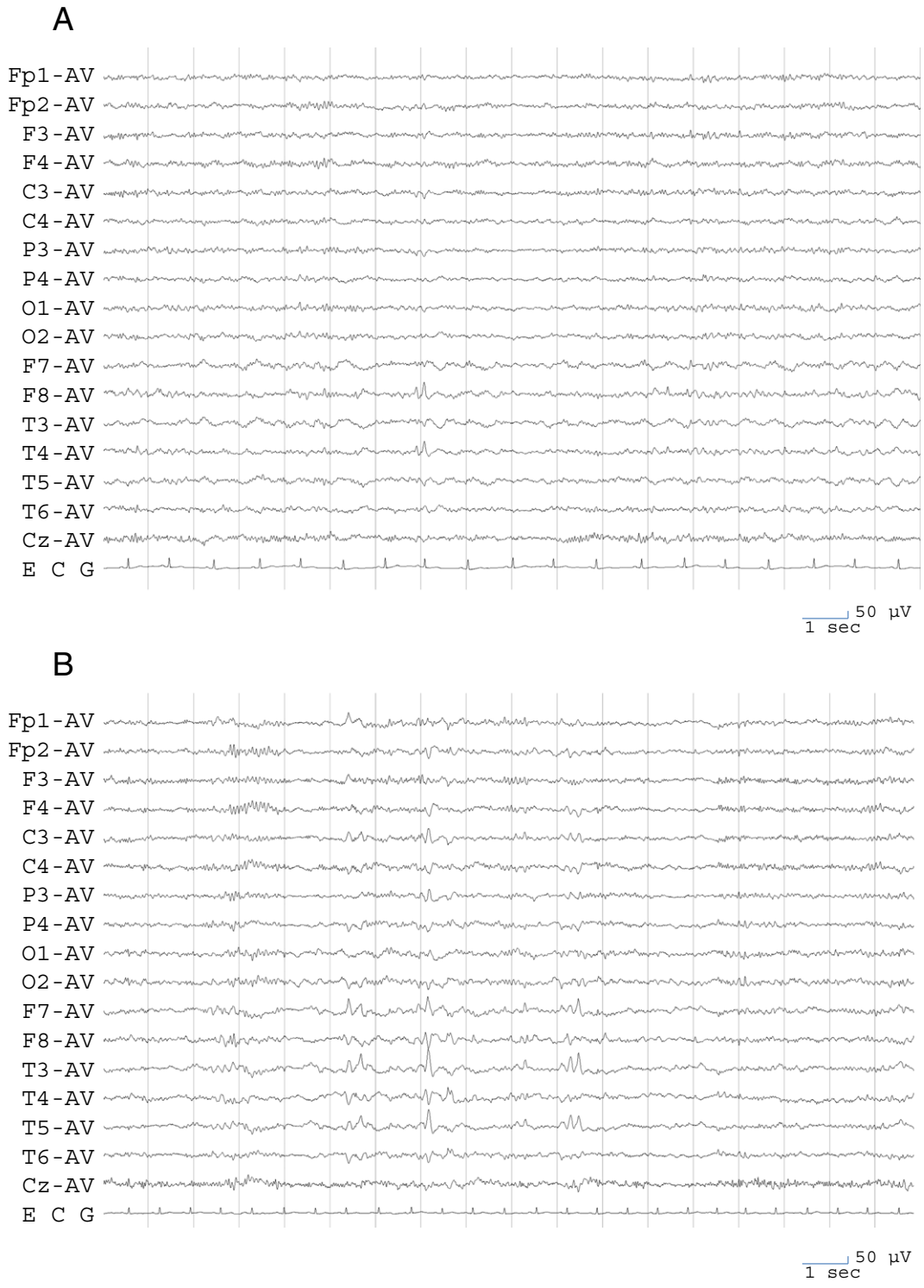

Fig. 1. Electroencephalogram findings. A. An electroencephalogram recorded during remission of psychosis at the first visit to our hospital. Sporadic sharp waves are evident at F8 and T4 and also at F7 and T3, though rarely. B. An electroencephalogram recorded during IIP. Frequent independent bitemporal sharp waves are evident and are particularly remarkable on the left side. C. An electroencephalogram recorded during PIP. Frequent independent bitemporal sharp waves are evident and are particularly remarkable on the left side. D. An electroencephalogram recorded during remission of psychosis after starting lamotrigine. Epileptiform discharge remarkably decreased, and only right temporal sharp waves are evident.