Epilepsy & Behavior 60 (2016) 7–10

Contents lists available at ScienceDirect

Epilepsy & Behavior

journal homepage: www.elsevier.com/locate/yebeh

Brief Communication

"God has sent me to you": Right temporal epilepsy, left prefrontal psychosis

Shahar Arzy [a,b,*], Roey Schurr [a]

[a] Neuropsychiatry Lab, Department of Neurology, Hadassah Hebrew University Medical Center, Jerusalem 9112001, Israel
[b] Department of Medical Neuroscience, Faculty of Medicine, The Hebrew University, Jerusalem 9112001, Israel

ARTICLE INFO

Article history:
Received 19 January 2016
Revised 8 April 2016
Accepted 8 April 2016
Available online xxxx

Keywords:
Postictal psychosis
Delusion
Religious
EEG

ABSTRACT

Religious experiences have long been documented in patients with epilepsy, though their exact underlying neural mechanisms are still unclear. Here, we had the rare opportunity to record a delusional religious conversion in real time in a patient with right temporal lobe epilepsy undergoing continuous video-EEG. In this patient, a messianic revelation experience occurred several hours after a complex partial seizure of temporal origin, compatible with postictal psychosis (PIP). We analyzed the recorded resting-state EEG epochs separately for each of the conventional frequency bands. Topographical analysis of the bandpass filtered EEG epochs revealed increased activity in the low-gamma range (30–40 Hz) during religious conversion compared with activity during the patient's habitual state. The brain generator underlying this activity was localized to the left prefrontal cortex. This suggests that religious conversion in PIP is related to control mechanisms in the prefrontal lobe-related processes rather than medial temporal lobe-related processes.

1. Introduction

As a brain-based cognitive phenomenon, our understanding of religion may profit much from neuroscientific investigation of people with religious and spiritual conversions as well as practicing mystics [1–4]. A special case of religious conversion may occur in psychosis related to various neuropsychiatric disorders, such as epilepsy (especially temporal lobe epilepsy, TLE) and schizophrenia [5]. In epilepsy, clinical observations suggest an association of religious experiences not only with epileptic ictus (seizures), but also with the interictal (between seizures) and postictal (after seizures) phases [5,6]. Notably, the majority of prominent religious experiences in patients with epilepsy occur during postictal phases [7]. Therefore, most of them are diagnosed as "postictal psychosis" (PIP) [8–11]. Postictal psychosis refers to brief psychotic episodes that follow a cluster of seizures or seizure exacerbation and has been reported in the setting of presurgical evaluation, in which antiepileptic drugs are tapered to provoke seizures [9,12–14]. The psychotic symptoms may resemble positive symptoms of schizophrenia, including grandiose delusions, delusions of reference, hallucinations and religious delusions, as well as affective symptoms (such as mania and depression) [9,12,13].

The association between religion and psychosis is also widely acknowledged. Delusions and hallucinations with religious contents are common in psychotic disorders including bipolar disorder, schizophrenia, and hallucinogen-induced psychosis, and their prevalence ranges from 38% to 91% in different cultures and studies [15,16]. Phenomenologically, religious content is common in the acute phase of schizophrenia (religious delusions and hallucinations with religious content) and in habits of patients in the chronic phase. Religious content also influences treatment adherence in individuals diagnosed with schizophrenia [17]. Religious contents are abundant in auditory hallucinations of God, the devil, prophets, or saints; paranoid delusions of possession; and grandiose delusions of one being a heroic savior. Though the presence of religious content in psychoses is not restricted to a specific type of religion, the content itself was found to be associated with patients' religious upbringing and culture [15].

In neuropsychiatry, understanding of the underlying mechanism of clinical disorders may be valuable for comprehension of not only the disorder itself but also the disturbed function. Analysis of neuroscientific data of religious conversion may shed light on both the cognitive mechanisms of religious belief as well as the neurological basis of delusional psychosis. Here we were able to record the very moments of religious conversion under video-EEG. This enabled us to compare brain activity before religious conversion with that during conversion.

2. Patient

The patient was a 45-year-old single man, a factory worker with low-level education. He was an orthodox religious Jew of Sephardic origin, practicing rituals regularly, as is common in his surrounding society, without any special religious involvement, deep religious feelings, or scholarly interest. The patient suffered from generalized tonic–clonic

* Corresponding author at: Neuropsychiatry Lab, Department of Neurology, Hadassah Hebrew University Medical Center, Jerusalem, Israel. Tel.: +972 2 6776 940.
E-mail address: shahar.arzy@ekmd.huji.ac.il (S. Arzy).

http://dx.doi.org/10.1016/j.yebeh.2016.04.022
1525-5050/

seizures (GTCSs) since the age of seven. He was treated with phenytoin for nine years. The patient was subsequently free of seizures until he reached the age of 23, when GTCSs relapsed. The patient was administered phenytoin again and was later switched to carbamazepine, with no GTCS relapse ever since. In the recent years, he suffered from attacks during which he first reported "lip tremor" accompanied by anxiety. These were followed by a "change in speech", especially with respect to prosody, followed by a "general slowing in thought processes" for several minutes. There was no loss of consciousness, and there were no lateralized focal signs or other motor manifestations. The duration of these events was 30–60 s, sometimes up to 20 times a day, though the patient would sometimes be free of attacks for several weeks. When events occurred in a cluster, the patient suffered from a general anxiety state. Treatment with valproic acid was added with no clinical effect, and the patient was referred to our epilepsy center.

The patient's neurological status was unremarkable. Neuropsychological evaluation showed a low yet normal level of general intelligence with impairment in memory functions. Electroencephalogram showed intermittent right temporal slowing in the theta range. The patient was further evaluated by prolonged video-EEG recording. While medications were tapered down, several stereotypic attacks were observed in which the patient first reported a vague "feeling" that an attack approaches; then, he laid in bed, started masticating, looked to the left, and then moved slowly his left hand (which was in a dystonic position). This was followed by similar movements also in the right hand, as well as extensive anxiety. The patient was amnesic to the attack and confused for several minutes later yet did not exhibit loss of consciousness. Electroencephalogram during the attack showed right temporal rhythmic activity (Fig. 1A), followed by a generalized spike-and-wave activity. Interictal epileptiform activity was found in both temporal lobes, most prominently in the left. Magnetic resonance imaging showed an extensive right mesial temporal sclerosis (MTS; Fig. 1B). The patient was subsequently treated with a combination of carbamazepine and phenobarbital.

Eight hours following the last seizure, while lying in bed, the patient abruptly "froze" and stared at the ceiling for several minutes, stating later that he felt that God was approaching him. He then started chanting prayers quietly, looked for his Kippa and put it on his head, chanting the prayers more excessively. Then, abruptly, he yelled "And you are Adonai (name of the Hebrew God) the Lord!", stating later that god had revealed to him, ordering him to bring redemption to the people of Israel. The patient then stood up, detached the EEG electrodes from his skin, and went around the department trying to convince people to follow him, stating that "God has sent me to you". When further questioned, he said that he does not have a concrete plan, but he is sure that God is going to instruct him what he and his followers should do on their way to redemption. In an in-depth psychiatric evaluation, the patient was diagnosed as suffering from postictal psychosis (PIP), with no other psychiatric illness. The patient was treated with olanzapine. The psychotic state resolved within several hours.

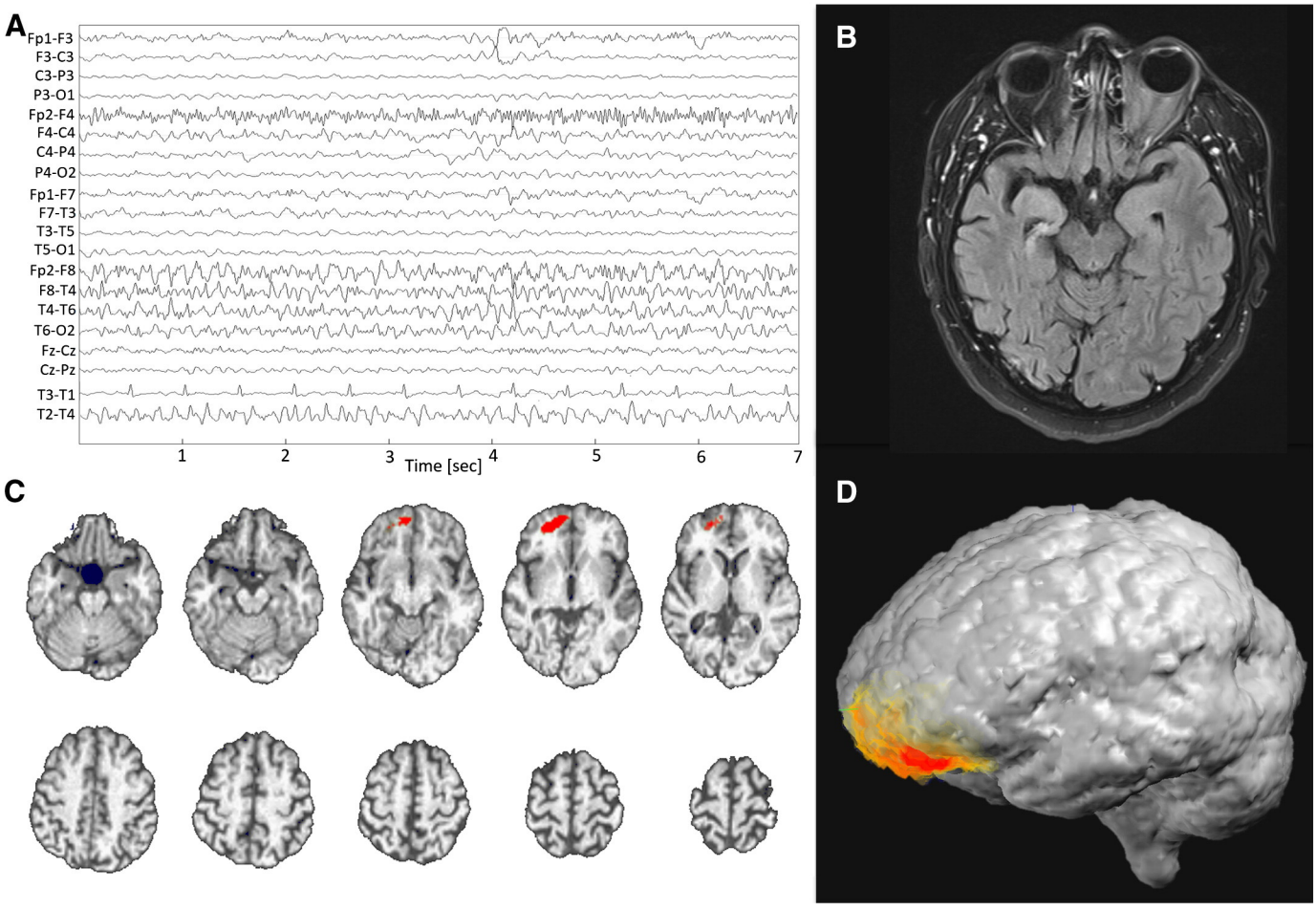

Fig. 1. (A). Ictal EEG activity during the seizure that preceded religious conversion was localized to the right temporal lobe. (B) MRI (T2, axial slice) of the patient's brain shows prominent right mesial temporal sclerosis. (C). Comparison of resting-state EEG periods recorded during postictal psychosis of delusional religious conversion and those recorded during interictal epochs using topographical electrophysiological analysis in the frequency domain revealed a significant hyperactivation in low-gamma power (30–40 Hz) in left PFC during the psychotic event. EEG generators are projected on the patient's MRI in axial slices. (D) The same EEG generators projected on the patient's MRI in 3D reconstruction.