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Short Report

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Ping-pong gaze in a refractory focal status epilepticus

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Abstract

An 83-year-old woman presented to emergency department with fever, low level of consciousness and right deviation in the conjugate gaze. Neurological examination revealed a spontaneous, slow, horizontal and continuous conjugate eye deviation alternating every 2 to 3 seconds. An electroencephalogram revealed periodic paroxysmal activity with a frequency of 2-3 Hz in left frontal hemispheric. Neuroimaging didn't show pathological findings. Polymorphonuclear leukocytes were observed in CSF without evidence of microorganisms.

Antiepileptic therapy was started without improvement. Finally, the patient died because of refractory focal status.

Ping Pong Gaze (PPG) is a slow and rhythmical horizontal abnormal eye movement with a fixed frequency that is observed in comatose states and indicates diffuse structural brain lesions with preserved brainstem functions. PPG presence is an indicator of bad prognosis.

We describe a PPG case with a synchronous eye movement with the electroencephalogram activity.

Keywords: Ping-pong gaze; status epilepticus; electroencephalography; epilepsy; seizure.

Short report

An 83-year-old woman with a history of multiple episodes of transient alteration of the speech, which was attributed to transient ischemic attacks was presented at emergency department because of low level of consciousness accompanied by right eye deviation, and fever. Neurological examination revealed bilateral unreactive mydriasis with spontaneous, slow, horizontal and continuous conjugate eye deviation alternating every 2 to 3 seconds (Supplementary file video 1). She also had left hemiparesis. The computed tomography scan showed global atrophy and multiples chronic lacunars strokes.

A non-convulsive status epilepticus was suspected and an Electroencephalogram (EEG) was requested. It showed a semiperiodic paroxysmal activity with a frequency of 2-3 Hertz in left frontal hemispheric (Figure 1). During the EEG recording, diazepam was administrated intravenously, which caused a change of the EEG pattern for 45 seconds. This change was linked to a suppression of the horizontal abnormal alternating ocular movement. After this transient period, the left frontal discharges were observed again.

Figure 1: Periodic paroxysmal activity with a frequency of 2-3 Hz in left frontal hemispheric.

Given the suspicious of meningoencephalitis, the lumbar puncture was performed and the cerebrospinal fluid study (CSF) showed pleocytosis predominantly polymorphonuclear cells. Microbiological examination of CSF was negative for all types of microorganisms. Coagulation, liver and kidney functions and ionogram were unremarkable.

Antiepileptic drugs such as valproate and lacosamide were initiated as well as empiric antibiotic treatment. Nonetheless, there was not improvement and she stayed in a non-reactive coma persisting the abnormal ocular movements. According these clinical finding and following the Salzburg criteria, the patient was diagnosed of non-convulsive status epilepticus. Finally, over next few hours the patient died because of aspiration pneumonia.

Ping Pong Gaze (PPG) is a slow and rhythmical horizontal abnormal eye movement with a fixed frequency that is observed in comatose states and indicates a diffuse structural brain lesion with preserved brainstem functions [1,2]. It was firstly described by Selenick in 1976 in a patient with cerebellar haemorrhage and it is caused by the lack of cortical inhibition to the horizontal gaze centres in the brainstem due to the disconnection of the brainstem from the cortex.

The main cause of PPG is an acute and large ischemic stroke. Other causes less commonly described are hypoxic-ischemic encephalopathy, post-seizure state - it disappears when the patient become awake -, monoamine oxidase and tricyclic toxicity, tumours and head trauma [1,3].

The appearance of PPG is an indicator of bad prognosis because it implies a bilateral extensive cortical damage and most of the patients finally died or remained in a vegetative state. PPG either in one hemifield or with a preference has also been described in patients with unilateral or asymmetric bilateral hemispheric lesions, corresponding the hemifield side with the side of dominant hemispheric lesion [1,4,5].

Conclusion

To our knowledge, we describe the first case of PPG with synchronous EEG activity. These EEG findings met Salzburg Criteria for refractory non-convulsive status epilepticus [5]. We hypothesized that the semi-periodic paroxysmal activity in the left hemisphere was the representation of the initial insult that caused generalized cortical inhibition and, subsequently the release of the activity of the brainstem nuclei that control the ocular movements.

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