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# Differential diagnosis by EEG of dissociative status versus nonconvulsive status epilepticus

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**Introduction.** Nonconvulsive status epilepticus (NCSE) has different clinical presentations, from minimal confusion to bizarre behavioral manifestations, psychosis or coma. As a result, patients can sometimes be misdiagnosed and labeled as psychiatric cases.

**Clinical case.** The patient was alert and disoriented in time, with disconnection episodes, generalized slowness, slow mental response, faltering language and slow answers. A differential diagnosis between dissociative status and NCSE was proposed. The physical and neurological examinations were normal. The cranial CT scan findings were normal. Only the EEG provided the definitive diagnostic data, consisting of generalized spike and wave discharges of 2-3 Hz against a desynchronized background.

**Conclusions.** Diagnosis of NCSE requires the availability of an EEG. Often patients are on the border between medical conditions and mental disorders. Observation of the disease evolution and an open-minded attitude of physicians are necessary for the correct diagnosis and treatment.

**Key words (MeSH):**
Differential Diagnosis, Dissociative Disorders, Electroencephalogram, Non-Convulsive Status Epilepticus

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## Diagnóstico diferencial mediante EEG entre cuadro disociativo y estatus epiléptico no convulsivo

**Introducción.** El estatus epiléptico no convulsivo (EENC) incluye diferentes formas clínicas, desde una mínima confusión hasta alteraciones complejas del comportamiento, la psicosis o el coma. Por ello a veces el paciente puede ser mal diagnosticado y etiquetado como psiquiátrico.

**Caso clínico.** Consciente y desorientada en el tiempo, episodios de desconexión, lentitud generalizada, bradipsíquia, lenguaje entrecortado y con lentitud en las respuestas. Se planteó el diagnóstico diferencial entre estado disociativo y EENC. Tanto la exploración física general como la neurológica fueron normales. El TC craneal fue normal. Sólo el EEG aportó el dato definitivo al presentar descargas de punta-onda generalizadas entre 2-3 Hz y desincronización del trazado de base.

**Conclusiones.** El diagnóstico de EENC requiere la disponibilidad de EEG. A menudo se presentan pacientes en la frontera entre la patología médica y los trastornos mentales, la observación de la evolución y una actitud abierta por parte de los profesionales es necesaria para un correcto diagnóstico y tratamiento.

**Palabras clave (MeSH):**
Diagnóstico diferencial, Electroencefalograma, Estados disociativos, Estatus epiléptico no convulsivo

## INTRODUCTION

Nonconvulsive status epilepticus (NCSE) is a term that covers a large number of clinical conditions that share the common denominator of producing a prolonged state of mental impairment due to underlying critical epileptiform brain bioelectrical activity (BBA). The prognosis of NCSE depends on the etiology and clinical presentation, which ranges from minimal confusion to complex behavioral changes, psychotic states or coma. Consequently, diagnostic errors may sometimes occur and, if NCSE is not considered, the patient may be misdiagnosed and labeled as a psychiatric patient.[1]

In this case, because of her clinical characteristics, the patient was referred to psychiatry because NCSE was overlooked as a possible diagnosis.

## CLINICAL OBSERVATION

The difficulty of this case was due mainly to the fact that the patient could not provide information about her

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clinical status because she had brought no previous reports and her clinical records were not available in the emergency room. She was accompanied by her mother, who did not exactly remember her daughter's history.

## Emergency room interview

### *Current illness*

The patient had been disconnected from her environment for the previous 24 hours.

### *Personal history*

- **Medical history.** Her records indicated no allergic reactions to medications and ovarian cystectomy. The patient experienced a "seizure" episode 15 years earlier that was described as generalized tremors of short duration. She also had an episode of disconnection seven years earlier that was described as "similar to today's block."
- **Psychiatric history.** The patient experienced an anxiety-depression syndrome 8 years earlier, with nocturnal panic attacks. She was currently being treated with bromazepam 1.5 mg (0-0-1.5).
- **Family history.** The patient was a 45-year-old woman who had been divorced for a year and half and had two children (a 17-year-old son and a 12-year-old daughter). She lived alone with her children and worked as a geriatric care assistant.

### *Present illness*

In the last 2-3 weeks the patient presented disconnection episodes that had become more frequent in recent days. In the last 24 hours, the patient was continuously disconnected, with generalized slowness and mutism.

### *Physical examination*

The general physical examination showed no significant findings.

Neurological examination: The patient was alert and oriented to space and person, but disoriented in time. She showed isochoric and normoreactive pupils, a vacant gaze without abnormal movements, no cranial nerve abnormalities, 5/5 strength in all 4 limbs, symmetrical deep tendon reflexes 2/3, plantar reflex present and normal sensitivity. Cerebellar tests yielded normal results. She had a negative Romberg sign and no gait abnormalities. The patient had slowed mental reactions with slow speech, staccato speech and slow response, although she obeyed simple commands. No convulsive movements were witnessed at any time.

### *Diagnostic judgment*

No focal neurological signs were observed. The patient was diagnosed as likely conversion disorder or dissociative disorder and was referred to a psychiatrist for evaluation.

## Evaluation in the psychiatric emergency room

### *Present illness*

(the patient's mother was again questioned): According to her mother, on the evening before her episode of tremors 15 years earlier, *"she was the same as today,"* referring to the clinical manifestations of disconnection syndrome and mental block. The family had noticed worsening of her mood in the past year, which was consistent with her marital separation and its social and economic impact.

### *Psychopathological examination*

The patient was alert and disoriented in time. She was mute, had a puzzled expression, and the interview could not be conducted because she was unable to answer basic questions and her response was delayed. She also had a language block, answering the question *"How many children do you have?"* with *"Two,"* and the question *"How old are your children?"* with *"Two"* as well.

### *Diagnostic judgment*

In the differential diagnosis, complex partial seizure (NCSE), dissociation/conversion disorder, acute psychotic episode, and depressive episode with psychotic symptoms were considered.

As the first option for the suspected clinical diagnosis of NCSE, EEG and a complete physical examination with laboratory tests and neuroimaging were considered necessary, although the clinical presentation also suggested a dissociative or psychotic disorder.[2]

## Joint neurological and psychiatric decision

The patient was admitted to the emergency room observation section on the joint decision of internal medicine and psychiatry for completion of her work-up and to await the clinical outcome. Paradoxically, at admission the diagnostic judgment of internal medicine was probable

dissociation/conversion disorder whereas the judgment of psychiatry was likely nonconvulsive status epilepticus.

An emergency unenhanced CT scan yielded normal results.

During the EEG recording, the patient was conscious but confused, occasionally responding incoherently. Finally, the EEG was reported as: highly abnormal EEG results consistent with nonconvulsive status epilepticus. Spike-wave discharges of 2-3 Hz and up to 5 seconds duration separated by periods of attenuation and desynchronization of the baseline tracing were evident; low amplitude 5-6 Hz rhythmic activity was observed in one of these periods.

In view of the EEG diagnosis, the patient was admitted to the neurology department.

### Admission to the neurology department

Clinical judgment: nonconvulsive status epilepticus.

- Treatment: topiramate 100 mg/12 h and levetiracetam 1000 mg in an IV bolus followed by 1000 mg/12 h IV. The patient evolved over the next few hours to almost complete improvement without clinical episodes or disconnection suggesting seizures.
- The day after admission, the EEG was repeated: The results of the study were pathological, showing brain activity within normal limits, generalized epileptiform activity of possible left middle temporal origin with moderate persistence.

After reviewing the patient's complete medical records and re-interviewing her when NCSE had remitted, the following information was obtained: She had been seen 8 years earlier in psychiatry for nocturnal panic attacks and 6 months later she was brought to the emergency room for loss of consciousness with tonic-clonic movements of the lower limbs. For two days preceding this episode, she was absent, isolated, mute and did not seem to follow conversations. The EEG (very active paroxysmal disorder with a right fronto-temporal focus and frequent generalization) was diagnostic of temporal lobe epilepsy and depressive anxiety disorder. The patient was treated with bromazepam 1.5 (1-0-0) and topiramate 150 (1-0-1). She had not had any episodes in the last 7 years.

In the current episode, the disconnection events have been more frequent despite good compliance with therapy. It is important that the patient had recently taken antibiotics and expectorants prescribed by her primary care physician for upper respiratory infection.

The patient was discharged after 3 days of admission with complete remission of her symptoms and treatment with levetiracetam 1000 mg (1-01) and topiramate (100-0-150). In a follow-up visit to the neurology clinic 3 months after this admission, the patient was euthymic and continued to remain free of episodes. No epileptiform activity was observed in the EEG.

## DISCUSSION

This epileptic patient suffered a clinical decompensation. The most likely cause of it, despite the patient's good therapeutic compliance, may have been the administration of antibiotics, which lower the threshold for cerebral seizures and can induce NCSE.[3] Several findings were consistent with the clinical manifestations of NCSE, such as the onset, which can be either abrupt or gradual, the duration, which ranges from thirty minutes to days or months, and the fluctuating symptoms, which condition the degree of impairment and make diagnosis difficult. In addition, the clinical presentation with psychiatric symptoms causes many cases of NCSE to be misdiagnosed, thus delaying proper clinical management.[4] Among the psychiatric manifestations of NCSE that can appear are: inattention, disorientation, confusion, mood changes, cortical blindness, speech disorders, echolalia, confabulation, bizarre behavior (inappropriate laughing, singing or dancing), psychotic states, autonomic nervous system disorders, sensory disturbances and coma.[1] The differential diagnosis can also be made with affective focal status epilepticus, in which the patient may present fear, sadness, joy or anger alone as the only clinical manifestation.[5]

## CONCLUSIONS

The diagnosis of NCSE requires the availability of EEG,[6] although the medical, neurological, psychiatric, familial, social and pharmacological history is important in the diagnosis. NCSE is a paradigm for the field of neuropsychiatry because, given its highly variable clinical presentation. If NCSE is not included in the initial differential diagnosis, it can be misinterpreted as a psychiatric situation, thus delaying proper treatment.

In clinical practice we often have patients who straddle the line between medical conditions and mental disorders and tend to be referred back and forth between medical and psychiatric clinics. Observation of the patient's evolution and an open attitude on the part of the practitioners of each specialty are needed for the correct diagnosis and treatment.

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