

# Neurocritical Care

## Status Epilepticus Review



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### KEYWORDS

- Status epilepticus • Convulsions • Nonconvulsive • Treatment
- Continuous electroencephalogram monitoring • Intensive care unit
- Refractory status epilepticus

### KEY POINTS

- Control seizures as soon as possible and do not undertreat.
- Determine the underlying cause of seizures rapidly and address this if possible.
- Once convulsions have ceased consider NCSz.

### INTRODUCTION

Status epilepticus (SE) is a life-threatening medical and neurologic emergency that requires prompt diagnosis and treatment. SE may be classified into convulsive and nonconvulsive, based on the presence of rhythmic jerking of the extremities. Refractory status epilepticus (RSE) is defined as ongoing seizures failing to respond to first- and second-line anticonvulsant drug therapies. Among RSE patients, 10% to 15% fail to respond to third-line therapy, and are considered to have super-refractory SE (SRSE). Patients with SRSE are not well studied, and in the absence of randomized clinical trials, treatment is controversial.

SE is defined as convulsions lasting for 5 or more minutes or recurrent episodes of convulsions in a 5-minute interval without return to preconvulsive neurologic baseline. A typical secondarily generalized tonic-clonic seizure generally stops by 3 minutes and almost always by 5 minutes.<sup>1</sup>

Patients with nonconvulsive SE (NCSE) do not exhibit overt signs of convulsions but have seizure activity documented on electroencephalogram (EEG).

Treatment efficacy, morbidity, and mortality are directly related to delays in starting therapy.

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Level of consciousness should start to improve within 20 minutes of cessation of the convulsions. If mental status remains abnormal for 30 to 60 minutes after the convulsions cease, NCSE must be considered, and urgent EEG is advised.

## EPIDEMIOLOGY

SE accounts for 20% of emergency department visits for neurologic problems and 1% of all emergency department visits,<sup>2–4</sup> with a 9% to 27% 30-day mortality rate.<sup>5</sup>

Following the apparent resolution of clinical seizures, nonconvulsive electrographic seizures (NCSz) persist in 20% to 48% of patients, and 14% of patients are in NCSE without any clinical signs of seizure activity.

In neurologic intensive care units (ICUs), up to one-third of patients will have NCSz, and most of these patients will be in NCSE.

In medical ICU settings, the incidence of NCSE is estimated to be near 10%,<sup>6</sup> and it is particularly prevalent in patients with sepsis.<sup>7</sup>

RSE occurs in 30% to 43% of patients with SE.<sup>8</sup>

## DIAGNOSIS AND CLINICAL PRESENTATION

Patients with generalized tonic–clonic status epilepticus (GCSE) present with continuous or repeated generalized tonic–clonic movements or rhythmic jerking of the extremities. Patients also exhibit alteration in their mental status ranging from decreased attentiveness and impaired responsiveness to a deep comatose state between convulsions. After convulsions have ceased, focal findings such as a focal motor impairment, also known as Todd paralysis, may persist.

NCSE has been described as electroclinical dissociation whereby patients may have ictal discharges on EEG, with or without subtle convulsive movements that may include twitching of the arms, legs, trunk, or facial muscles, tonic eye deviation, and nystagmoid eye jerking.

Psychogenic nonepileptic SE needs to be included in the differential diagnosis in patients who demonstrate poorly coordinated limb thrashing, back arching, pelvic thrusting, forced eye closure, head rolling, and preserved consciousness or purposeful movements. It is crucial to note that when in doubt, patients should be expeditiously treated as if they have SE.

## DIFFERENTIAL DIAGNOSIS

Conditions to consider for the differential diagnosis include movement disorders (myoclonus, asterixis, tremor, chorea, tics, dystonia); herniation (decerebrate or decorticate posturing); Limb-shaking transient ischemic attacks, most commonly associated with perfusion failure due to severe carotid stenosis; psychiatric disorders (eg, psychogenic nonepileptic seizures, conversion disorder, acute psychosis, or catatonia); postanoxic myoclonus; or any condition that may lead to decreased level of consciousness (eg, toxic metabolic encephalopathies, including hypoglycemia and delirium, anoxia, and central nervous system [CNS] infections), transient global amnesia, sleep disorders (eg, parasomnias), and syncope.

## DIAGNOSTIC WORK-UP

The diagnostic work-up should be conducted in parallel with treatment. Following are guidelines published by the Neurocritical Care Society for the evaluation and management of SE all patients should receive:<sup>9</sup>

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