Current Concept of Definition and Classification of Status Epilepticus

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Guidelines for the Evaluation and Management of Status Epilepticus

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Definition of Status Epilepticus


- SE was defined as 5 min or more of
  1. Continuous clinical and/or electrographic seizure activity; or
  2. Recurrent seizure activity without recovery (returning to baseline) between seizures
Why use 5 minutes as the limit?

Most clinical and electrographic seizures last <5 min

Seizures that last longer often do not stop spontaneously


Why use 5 minutes as the limit?


- Animal data suggest that permanent neuronal injury and pharmacoresistance may occur before the traditional definition of 30 min of continuous seizure activity have passed.


Why use 5 minutes as the limit?


More recently, experts have suggested a revised definition of SE which includes seizures lasting for 5 min or longer


Classification of SE

- **Semiology**
  - Convulsive SE vs Non-Convulsive SE

- **Duration**
  - Early, Established, Refractory and Super-refractory

- **Underlying etiology**
Classification of SE

- **Semiology**
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- **Underlying etiology**
Types of SE

- **Convulsive SE**
  - Generalized SE
    - Primary Generalized: tonic-clonic, clonic-tonic-clonic, myoclonic
    - Secondarily Generalized: partial seizures with secondary generalization, tonic
  - Simple Partial SE
    - Typical, epilepsia partialis continua

- **Non-Convulsive SE**
  - Generalized SE
  - Absence, atypical absences, atonic, a sequel of partially treated GCSE
  - Complex Partial SE
Convulsive SE

- Defined as **convulsions** that are associated with **rhythmic jerking of the extremities**
  - Generalized convulsive SE (GCSE)
  - Focal Motor SE / Epilepsia Partialis Continua
Generalized Convulsive SE

- Generalized tonic–clonic movements of the extremities
- Mental status impairment
  - coma, lethargy, confusion
- May have focal neurological deficits in the postictal period, lasting hours to days
  - e.g. Todd’s paralysis
Non-Convulsive SE (NCSE)

- Defined as seizure activity seen on EEG without clinical findings associated with GCSE

- Two distinct phenotypes
  - “Wandering confused” patient or patient with chronic epileptic syndromes; a relatively good prognosis
  - Acutely ill patient with severely impaired mental status, with or without subtle motor movements
    - e.g., rhythmic muscle twitches or tonic eye deviation that often occurs in the setting of acute brain injury
Classification of SE

- **Semiology**
  - Convulsive SE vs Non-Convulsive SE

- **Duration**
  - Early, Established, Refractory and Super-refractory

- **Underlying etiology**
Stages of Convulsive SE


- **Stage 1: Stage of Early SE**
  - Up to 30 min

- **Stage 2: Stage of Established SE**
  - 30 to 120 min
Classification of SE

- **Semiology**
  - Convulsive SE vs Non-Convulsive SE

- **Duration**
  - Early, Established, Refractory and Super-refractory

- Underlying etiology
Refractory Status Epilepticus

**Definition**

- **Ongoing seizures following 1\textsuperscript{st} and 2\textsuperscript{nd} line drug therapy**
  

- **Persistent clinical or EEG SE after 1\textsuperscript{st} and 2\textsuperscript{nd} line Rx within 60 min of SE onset**
  
  (Rossetti et al. Epilepsia 2004;45:757-63)

- **Clinical and/or EEG seizures that are refractory to loading or protracted maintenance dose of at least 3 AEDs**
  
  (Mirsattari et al. Arch Neurology 2004;61:1254-9)
Definition of Super-Refractory SE

- SE that continues or recurs **24 h or more** after the onset of anaesthetic therapy, including those cases that recur on the reduction or withdrawal of anaesthesia

- *A term first used in the 3rd London-Innsbruck Colloquium on status epilepticus held in Oxford on 7–9th April 2011*

  (Shorvon and Trinka, 2011)
Stages of Convulsive SE
Shorvon et all: 2008 & 2011

- **Stage 1: Stage of Early SE**
  - Up to 30 min

- **Stage 2: Stage of Established SE**
  - 30 to 120 min

- **Stage 3: Stage of Refractory SE**
  - >120 min

- **Stage 4: Stage of Super-Refractory SE**
  - >24 hr
Super-Refractory SE

- Typically encountered in two quite distinctive clinical situations
  - In patients with **severe acute brain injury**
  - In patients with no history of epilepsy in whom SE develops out of the blue with no overt cause
    - **NORSE: new-onset refractory status epilepticus**

Rathakrishnan & Wilder-Smith, 2009
Etiologies of SRSE

- **Severe Brain Insult**
  - Cause is readily apparent from history and/or neuroimaging
    - Trauma
    - Infection
    - Stroke

- **Less Common Causes**
  - Immunological disorders
  - Mitochondrial disorders
  - Uncommon infectious diseases
  - Drugs or toxins
  - Uncommon genetic diseases

Tan et al., 2010; Shorvon et al., 2011