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Non-Convulsive Status Epilepticus in Emergency Department: A Diagnostic Challenge

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Abstract
Non-convulsive status epilepticus had always been a diagnostic dilemma to emergency physicians. The challenge falls in its elusive nature and the subtlety of physical findings. Understanding the essence this disease process and the approach to it will result into a rewarding outcome for the patient and the physician. In this brief review we are trying to shed some light on that ambiguous neurological emergency and try to come up with a facilitated way of dealing with this common source of morbidity and mortality.

Discussion

Non-convulsive status epilepticus (NCSE) is a term used to refer to a prolonged seizure without an overt motor signs. It's also defined as an altered mental status or change in the behavior from baseline with continuous epileptiform EEG changes. A review of literature showed that till now there is no acceptable definition. [1] NCSE are thought to be responsible for about 25% of the status epilepitcus. [2]

De Lorenzo et al conducted a retrospective study in which 164 patients were subjected to a continuous 24 hours EEG monitoring after seizure treatment. He found that 14% of the patients had a NCSE and about 48% of the patient had a persistent seizure activity on EEG. [3]Treiman et al also in a similar manner found that 25% of the patient had NCSE after treatment for GCSE when monitored by EEG in his study that included 384 patients. [23]

NCSE diagnosis has always been a diagnostic challenge to emergency physicians as there are no definitive diagnostic criteria, and due to the hectic nature of the emergency department its sound to difficult to do full neurological exam and in-depth medical history. [4] NCSE encompasses a group of syndromes that varies from self-limiting to refractory form. Absence SE and partial complex SE are the 2 major types that are commonly known although some recent data from medical literature had shown other subtypes.

Clinical suspicion and EEG findings are mainstay to establish the diagnosis. Clinically, high index of suspicions should be kept in cases of: [5]

- Prolonged postictal states
- Absence of other clinical explanation for the patients with altered mental status
- Stroke patients that seemed worse than expected
- Subtle signs (blinking, twitching, fluctuating sensorium. Etc.).

Other reported clinical features of the NCSE are: [6][7]

- Delusions
- Paranoia
- Hallucinations
- Catatonia
- Psychosis
- Automatisms
- Cyclonic jerks
- Eye twitching
- Eye deviation
- Verbal perseveration
- Aphasia
- Speech arrest
- Disorganized speech

Conflicting reports coming from medical literature about the pathognomonic EEG finding in NCSE, conclusively, it was noted that there wasreliable pathognomonic EEG pattern to be associated with this condition.

So, neither Clinical findings nor the EEG findings alone can diagnose NCSE reliably but with constellation of both we can establish the diagnosis. Also response to antiepileptic medication seen clinically and on the EEG can aid in the diagnosis but absence of response doesn't rule out. [1]

Furthermore, the NCSE diagnosis is complicated by the difficulty of differentiation from other causes of encephalopathies.

Differential considerations: [8][9]

- Metabolic encephalopathy
- Complex migraine
- Posttraumatic amnesia
- Hypoglycemia
- Prolonged postictal state
- Psychiatric disorders
- Substance intoxication (lithium, baclofen, tricyclics and tiagabine)
- Detoxification from medications/drugs (alcohol, benzodiazepines)
- Transient ischemic attack
- Transient global amnesia

Etiologically, Occurrence of NCSE is attributed to a number of disorders; theses include Metabolic, electrolytes, hepatic encephalopathy, hypertensive encephalopathy, posterior reversible encephalopathy syndrome (PRES), uremia, SLE, cerebral lesions, medications, illicit drugs and alcohol withdrawal. [10][11][12][13][14][15][16][17]

Hence it sees reasonable to direct our Investigation to rule out other possibilities:

- Blood tests to rule out electrolytes, liver, renal and heamatological disorders.
- Lumbar puncture to detect central nervous system infections.
- EEG and response to treatment on EEG.
- MRI and CT to rule out structural causes.

Amish et al in his study that was published in 2009 noted that abnormal EEG finding was the most prevalent investigation in patients presentencing with Status epilepicus in general. [5]

The Ideal treatment for the NCSE is not fully understood but its will known that management should be started as soon as possible and a delay will result in a permanent neurological damage after 20 min to 30 min of continuous seizure activity. [18][19][20][21][22]

In Emergency Department, treatment of NCSE begins in the same measures and medications as Generalized convulsive status epilepticus (GCSE) with The Airway, Breathing, circulations and then medications, Benzodiazepines as first line. Phenytoin, phenobarbital or valproicacid are the second line agents. For refractory cases additional agents might be considered.

In conclusion, NCSE is a neurological emergency that needs to be taken seriously same as GCSE. All emergency physicians should be aware and raise their level of suspicion as early diagnosis and treatment is of is paramount for this condition that required rapid intervention or else would result in a permanent neurological damage and poor prognosis. Also to avoid over diagnosis and aggressive use of AED`s and finally to keep things simple it seems logical and safer that since the treatment is not fully understood to follow the standard protocols of status epilepticus.

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