



Review Article

Status Epilepticus revisited

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ABSTRACT

Status Epilepticus (SE) is a medical emergency seen in all age groups. Status Epilepticus is defined as a continuous seizure lasting more than thirty minutes, or two or more seizures without full recovery of consciousness between any of them. For, all practical purpose any seizure that last for more than five minutes can be considered as status.

The approach and management of SE especially in older people pose a great challenge to the treating physician. The causes and clinical features in different age groups will be different. Multiple comorbidities, electrolyte disturbances, polypharmacy, frailty and delay in diagnosis will lead to increased mortality in older people.

There is worldwide consensus regarding treatment of status epilepticus, which is helping many lives being saved. Despite availability of newer antiepileptic drugs, the main stay in management of SE is the use of first line of injectable drugs with good results. These first line of injectable drugs are easily available even in rural parts of India which helps saves life. The need for ventilatory support especially in older people leads to increase in morbidity and mortality.

This article reviews current issues of convulsive Status Epilepticus in adults and older people.

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1. Introduction

It is life threatening medical emergency. It occurs in patients who are already living with epilepsy or can be presenting feature of epilepsy. It occurs in all ages. The guidelines in identification and management has remained same more or less for last three decades while use of new or second line antiepileptic is not much recommended as on now. The management of status epilepticus in pregnancy is very challenging and new guideline is framed by Indian authors in year 2018. Despite advances in investigation modalities, the pharmacological therapy when timely applied holds the key in management of patients.

1.1. Definitions

1.2. Epilepsy

It describes a condition in which a person has recurrent seizures due to a chronic, underlying process.

It refers to a clinical phenomenon rather than a single disease entity.

1.3. Seizure

It is a paroxysmal event due to abnormal, excessive, hypersynchronous discharges from an aggregate of central nervous system neurons.

1.4. Status Epilepticus

It refers to continuous seizures or repetitive, discrete seizures with impaired consciousness in the interictal period.

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1.5. Types

The status epilepticus is divided into three types. They are

1. Generalised Convulsive Status Epilepticus It is characterized by persistent generalised, tonic-clonic movements, electrographic seizures and Coma
2. Nonconvulsive Status Epilepticus
It is characterized by persistent absence seizure or partial seizures, confusion or partially impaired consciousness and minimal motor abnormalities.
3. Epilepsia Partialis Continua it is a continuous seizure activity in one part of the body such as finger or a limb, without loss of consciousness.

1.6. Etiology

Status epilepticus is the first manifestation in 10% of cases with epilepsy (1)

The causes / precipitants of status epilepticus are

1. Withdrawal of anticonvulsants
2. Noncompliance with anticonvulsants
3. Metabolic disturbances
4. Drug intoxication
5. Central Nervous System Infections
6. Central Nervous System Tumours
7. Refractory epilepsy
8. Head trauma
9. First unprovoked seizure

Noncompliance with medication was precipitating factor in 53% of those with prior seizure history.¹

1.7. Clinical features

The patient presents with tonic-clonic seizures lasting 2-3 minutes without regaining of consciousness between seizures, but continuous seizures also occur.

Paroxysmal episodes of hyperthermia, tachycardia and pupillary dilatation also occurs.

The non-convulsive status epilepticus presents with stupor, a confused state, clouding of consciousness, and little or no motor activity.

The duration of seizure activity sufficient to meet definition of status epilepticus has traditionally been specified as thirty minutes.² When the seizure activity prolongs for more than 30 minutes it leads to epileptic encephalopathy.

1.8. Refractory status epilepticus

The status epilepticus that does not abate with benzodiazepines and two other anticonvulsant drugs is called refractory status epilepticus.²

1.9. Investigations

1.10. Electroencephalogram (EEG)

The generalized atypical spike-wave of 1- to 2.5-Hz are seen on EEG. The waves may be grossly slowed and asymmetrical, being lower of amplitude on the side of causative focus.

It also plays an important role in identifying non-convulsive status epilepticus. It is characterized by irregular spike-wave activity, less well formed than that of typical in absence seizure and often waxing and waning.

In prolonged status, the ictal pattern may become progressively less dramatic and the interictal disturbances more severe.

The other investigations that need to be carried out are

1. Random blood sugar levels
2. CT Brain
3. MRI Brain
4. Serum electrolytes
5. Blood levels of antiepileptic drug(s) if taking prior.
6. Renal function tests
7. Liver function tests.

In 15% of cases, no cause can be found after thorough investigations¹

1.11. Treatment

The goal of the treatment is to eliminate seizure activity, identify and treat the underlying cause.

On arrival of patient, look for acute cardio respiratory problem and hyperthermia. Ensure airway, oxygenation by nasal cannula, rehydration, correction of acidosis, maintain blood pressure and monitor cardiac function.

Normal Saline should be initial fluid of choice as all the parenteral antiepileptics go well with it.

Perform a brief medical / neurological examination

Establish intravenous access and send blood for investigations.

Administer Injection Thiamine 100mg intravenously followed by IV 25% / 50% glucose in appropriate circumstances.

Start antiepileptic drugs immediately as per protocol in figure one.

Emphasis should be on ensuring adequate doses of the drug administered and while shifting from parenteral to oral therapy. Avoid phenytoin in patient with heart blocks while Phenobarbitone is safe in patient with heart blocks and in older people.

1.12. If status returns, the same drugs can be repeated.

Non-convulsive status epilepticus can be treated with intravenous lorazepam or Valproic acid or both.

In case, where there is difficulty to access intravenous line or the patient is in community, Lorazepam or

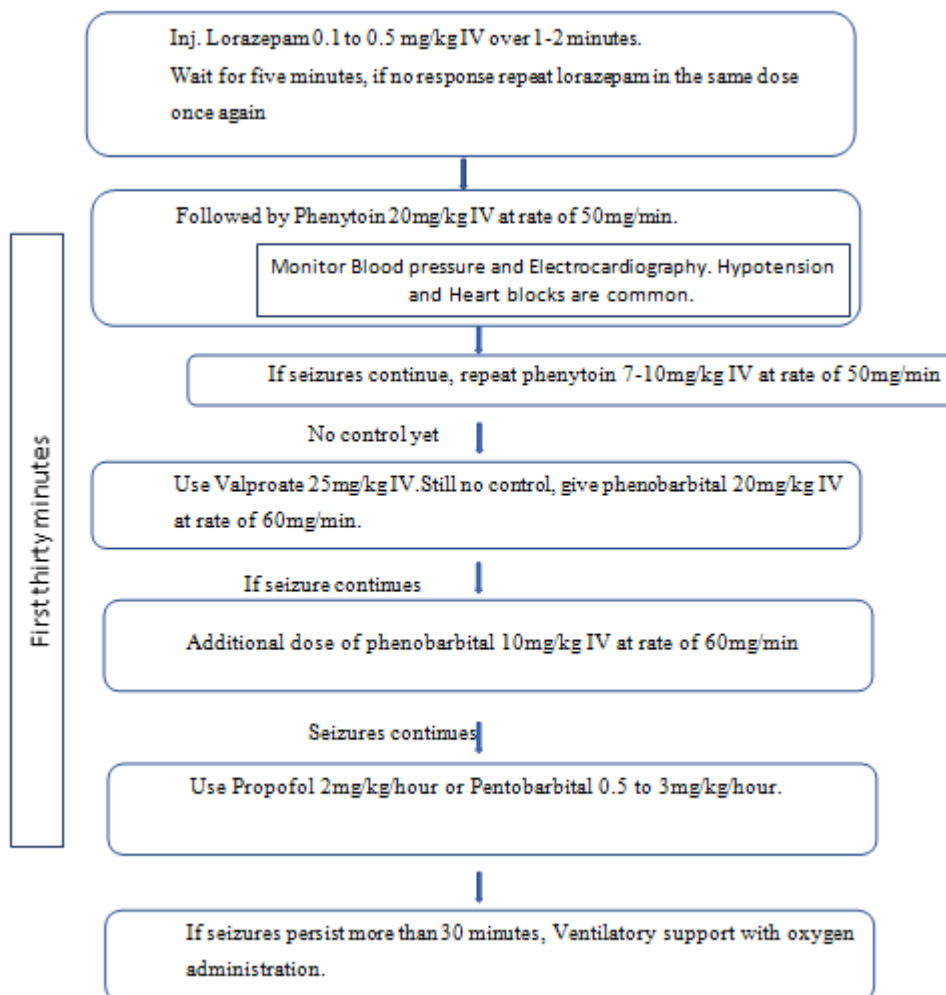


Fig. 1: Management of Status Epilepticus²

Midazolam can be given intramuscularly³

1.13. Treatment of Refractory Status Epilepticus

The refractory status epilepticus is treated by Phenobarbital 100mg/minute until the seizures have stopped or a total dose of 20mg/kg is reached.

The common side effects of phenobarbital are hypotension and prolonged state of stupor. These side effects can be overcome by simultaneous use of dopamine, intravenous fluids and neosynephrine.⁴

1.14. Status epilepticus in elderly

In, elderly population it is 2 to 5 times more common than in young adults

It has an incidence of 86 per 100,000 annually among older people.⁵ In elderly up to 30% of acute seizures present as Status Epilepticus.⁶

The common causes of status epilepsy in the elderly are stroke, degenerative disease, neoplasm, infection, and trauma.⁷

The differential diagnosis for status epilepticus are convulsive syncope, asterix, myoclonus, and psychogenic nonepileptic attacks in older people.

The mortality rate in patients aged 60 years is 38%, and nearly 50% for those over the age of 80 years⁶ while the refractory status epilepticus has mortality of 76%.⁸

1.15. Status epilepticus in pregnancy

Status epilepticus (SE) in pregnancy is rare. It can occur during gestation, labor, or puerperium.

The common causes are eclampsia, viral encephalitis, systemic lupus erythematosus, cavernoma, reversible cerebral vasoconstriction syndrome, pyridoxine deficiency, and aspartate N-methyl-D-aspartate (NMDA) receptor antibody mediated autoimmune encephalitis^{9–11}

Another important cause found by Rajiv KR et al (2017) is posterior reversible encephalopathy syndrome¹²

The treatment of status epilepticus in pregnancy is challenging and care to be taken regarding the teratogenicity of antiepileptic drugs.

A very useful protocol is framed by Rajiv KR et al (2018) for management of Status epilepticus in pregnancy. This helps the clinicians to treat with better outcomes both in mother and foetus.¹³ The readers are informed that the protocol can be downloaded from the web site <http://www.neurologyindia.com>

1.16. Complications

The commonest complications are

1. Cardio - respiratory dysfunction
2. Hyperthermia
3. Metabolic derangements.

1.17. Mortality

The mortality rate in status epilepticus in a study by Rowan AJ et al¹⁴ in year 1970. was 21% while the study by Hanhan UA et al¹⁵ in year 2001 is 3 to 20%. There is no much change in mortality rates in last 40 years despite advances in treatment modalities. Status epilepticus as such will not produce death. The causes of death are hypoglycemia, rhabdomyolysis, acidosis, hypertension, renal failure and injury sustained as result of convulsions. The catecholamines that are released during seizures leads to fatal cardiac arrhythmias.

The common post recovery sequelae is subtle or severe cognitive impairment.

2. Conclusion

The status epilepticus is dial emergency and treatment should be on priority with use of antiepileptics. Clinical diagnosis with support of biochemical measures and EEG still plays a vital role in diagnosis and management strategies. The prolonged phase of seizure activity and delay in initiating treatment leads to hypoxic brain injury which at time may delay the recovery. The status epilepticus occurs in all age groups and challenges are in managing in special categories like pregnancy and older people.

3. Source of Funding

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4. Conflict of Interest

None.

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