Status Epilepticus

Learning objectives:
1. Define Status Epilepticus.
2. Discuss the etiologies of status epilepticus .
3. Develop an effective plan (strategies) for the management of status epilepticus.

Definition of status epilepticus: is a continuous convulsion lasting longer than 30 min or recurrence seizure activity without regaining of consciousness.
Impending status epilepticus: when the seizure last between 5-30 min.
Refractory status epilepticus:is status epilepticus that has failed to respond to therapy, usually with at least 2 medications.

Status epilepticus may be classified as:
1. Convulsive status epilepticus:the most common type(generalized tonic,clonic,or tonic clonic) or
2. Nonconvulsive status epilepticus: (complex partial, absence) manifest as confusional state, hyperactivity with behavioral problems, fluctuating impairment of consciousness.

Status epilepticus is a medical emergency that requires an organized and skillful approach to minimize the associated mortality and morbidity.

Etiology:
There are three major subtypes of status epilepticus in children:

1. Febrile status epilepticus:
Is the most common type of status epilepticus.

2. Idiopathic status epilepticus:
Develops in the absence of an underlying CNS lesion. It includes:
A. Epileptic patients in whom status epilepticus followed sudden withdrawal or overdose of anticonvulsants.
B. Epileptic children who are given anticonvulsants on an irregular basis or who are noncompliant.
C. Status epilepticus may the initial presentation of epilepsy (30-40%).
D. Sleep deprivation and an intercurrent infection in epileptic children.

3. Symptomatic status epilepticus: when the seizure occurs as a result of an underlying neurologic disorder or metabolic abnormality .e.g. encephalitis, meningitis, electrolyte abnormalities (hypoglycemia, hypocalcemia …), drug intoxication and brain tumors.

Management

1. Initial management includes stabilization of airway, supporting respiration, maintaining blood pressure, and gaining intravascular access .Body temperature, blood pressure, ECG, and respiratory function should be monitored.

2. Blood glucose level should be determined and if hypoglycemia is confirmed 5ml/kg of 10% dextrose is given by rapid infusion.

3. Blood is obtained for electrolytes(including calcium , phosphorus , and magnesium), BUN ,CBC , anticonvulsant drug levels (if indicated) , blood and urine studies for metabolic and toxicology screen and arterial blood gases .

4. A lumbar puncture is indicated to rule out CNS infection unless a contraindication is suspected.

5. EEG monitoring is indicated in:

1. If the patient is paralyzed and is on a respirator to assess the frequency of seizure discharges, their location, and the response to anticonvulsant therapy.
2. To rule out pseudo-status epilepticus (psychological conversion reaction mimicking status epilepticus).

6. Drugs treatment:

Should always be administered IV in the management of status epilepticus.

1" Benzodiazepine (lorazepam, diazepam, or midazolam) **should** be used initially, because these are effective for immediate control seizures in most children by IV route.

2" When IV access is not available immediately rectal diazepam can be given, buccal or nasal midazolam is another option, and rectal or intranasal lorazepam can also be used safely.

3" Respiratory depression and hypotension can occur after benzodiazepine administration, especially if administered with a barbiturate.

4" If the convulsion activity ceases after benzodiazepine or if the seizures persist, the next medication is fosphenytoin, and the loading dose is usually 15-20 PE/kg. Fosphenytoin (phenytoin prodrug) has many advantages over phenytoin because it is water soluble, less irritating after IV injection, and well absorbed after IM injection.

5" Intravenous Phenobarbital at a loading dose of 15-20 mg/kg is a third-line drug if seizure persist.
Intravenous valproate can be used as a third-line medication.

6" If the status epilepticus is not controlled by the preceding drugs, many choices of drug management include:

- Diazepam infusion.
- Constant IV infusion of midazolam or propofol.
- Barbiturate coma: using thiopental in an ICU, the patient is placed on a ventilator and a continuous EEG monitor.

- Paraldehyde IV or rectal.
- General anesthesia using halothane and isoflurane.

Prognosis

The mortality rate of status epilepticus is about 4-5% .The greatest number of deaths occurs in the symptomatic group and the cause of death usually is related to the underlying abnormality.