

Case Number 7

Status Epilepticus

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Case summary:

Demographic details:

AC, Male, 67, St. Julian's.

67-year-old gentleman presented to the A&E department with new-onset generalised tonic-clonic seizures lasting about 30 minutes. A nasopharyngeal airway was inserted on arrival, intravenous access obtained and he was given intravenous diazepam to stop the seizures, followed by intravenous phenytoin under cardiac monitoring. Arterial blood gases revealed a type II respiratory failure and he needed intubation and transfer to ITU. He was also given ceftriaxone and acyclovir in A+E in view of his new onset *status epilepticus*. Once in ITU, no further seizures were recorded and he did not require any inotropic support. Further investigations including routine blood tests, toxicology as well as a lumbar puncture were normal. MRI head done the following day showed a high-intensity signal in the right temporal lobe region suggestive of Herpes Simplex Encephalitis.

After a 3 day stay in ITU, he was transferred to the ward and acyclovir continued for a total of 21 days. He remained well and was eventually discharged home.

Presenting complaint:

New-onset generalised tonic-clonic seizures.

History of presenting complaint:

This was the first time the patient experienced such seizures. He had his first seizure at home and then had a subsequent attack in the ambulance, which resolved spontaneously. These recurred in A+E, where he was noted to have eye-rolling and generalised tonic-clonic seizures with incontinence of urine. No fever, associated neck stiffness or other signs of meningism were present.

Past medical history:

Hernia repair.
Tonsillectomy.
Past history of suicidal thoughts related to anxiety.

Drug history:

The patient was previously well and on no regular medication.
Noted to have been on Deanxit in the past.
He has no known drug allergies.

Family history:

Brother suffers from epilepsy.

Social history:

The patient has a history of heavy alcohol intake until 1994.
He is also a heavy smoker, smoking 40 cigarettes daily. Pensioner.
He lives with his wife and is independent in all activities of daily living.

Systemic inquiry:

Nil to note

Discussion of results of general and specific examinations:

On examination (on admission to A+E):

Cardiovascular system: Normal heart sounds.

Respiratory system: Clear chest with mild crepitations on expiration.

Widespread decreased air entry which eventually improved.

Gastrointestinal system: Abdomen soft and non-tender.

Pupils: Equal and reactive to light.

Lower limbs: normal, no signs of oedema or any other abnormality.

Upper limbs: Flaccid left upper limb; tone normal in right upper limb- withdraws more to pain than left.

Unable to elicit upper limb reflexes; lower limb reflexes are normal; no plantar response.

Skin: No rashes observed.

Parameters:

Glasgow Coma Scale: 6

Temperature: 36.5 °C

Blood Pressure: 130/85 mmHg

HGT: 8.1 mmol/L

Heart Rate: 94 bpm

SpO₂: 95%.

Other Investigations:

CXR - nil of note .

CT brain - no midline shift or hemorrhage.

ECG - normal sinus rhythm, 118 bpm, isolated ventricular ectopic beats.

ABG - CO₂ retention; oxygen switched to 24% via Venturi mask.

CT Thorax/Abdomen/Pelvis – normal.

Anti-voltage gated potassium antibodies & Anti-neuronal antibodies – negative.

Differential diagnosis:

- Herpes Simplex Encephalitis
- Limbic encephalitis
- Paraneoplastic
- Auto-immune
- Low-grade glioma of the right frontal lobe region

Diagnostic procedures:

Laboratory Exams:

Test: Lumbar puncture.

Justification for test: In order to obtain CSF composition.

Result: Lab results showed mildly raised glucose and protein levels. No pleocytosis was evident.

Conclusion: A normal CSF does not rule out a viral encephalitis.

Test: Toxicology Screen.

Justification for test: To exclude intoxicants as cause for the seizures as well as to exclude sudden withdrawal from a seizure medication (patient in this case was not on any previous anti-epileptics).

Result: Negative lab results.

Conclusion: Seizures were not precipitated by an exogenous agent, an adverse drug reaction or increased/decreased levels of medication.

Instrumental Exam:

Test: CT thorax/abdomen/pelvis.

Justification for test: In view of possible paraneoplastic encephalitis.

Result: Small focal fibrotic changes seen in bases of lungs. Hepatic steatosis; no other abnormalities seen.

Conclusion: No paraneoplastic syndrome/ limbic encephalitis present.

Test: MRI head.

Justification for test: To exclude any structural brain lesion that could have precipitated the seizures.

Result: The right temporal lobe was shown to be oedematous with no apparent enhancement or restricted diffusion. Oedema of the right frontal lobe with a suggestion of mild enhancement, mass effect and possible mild restricted diffusion was also noted.

Conclusion: This is likely to represent herpes encephalitis.

Current Drug Therapy:

Patient was given 3 doses of 2.5mg diazepam IV in the acute scenario.

In ITU he was on the following medication:

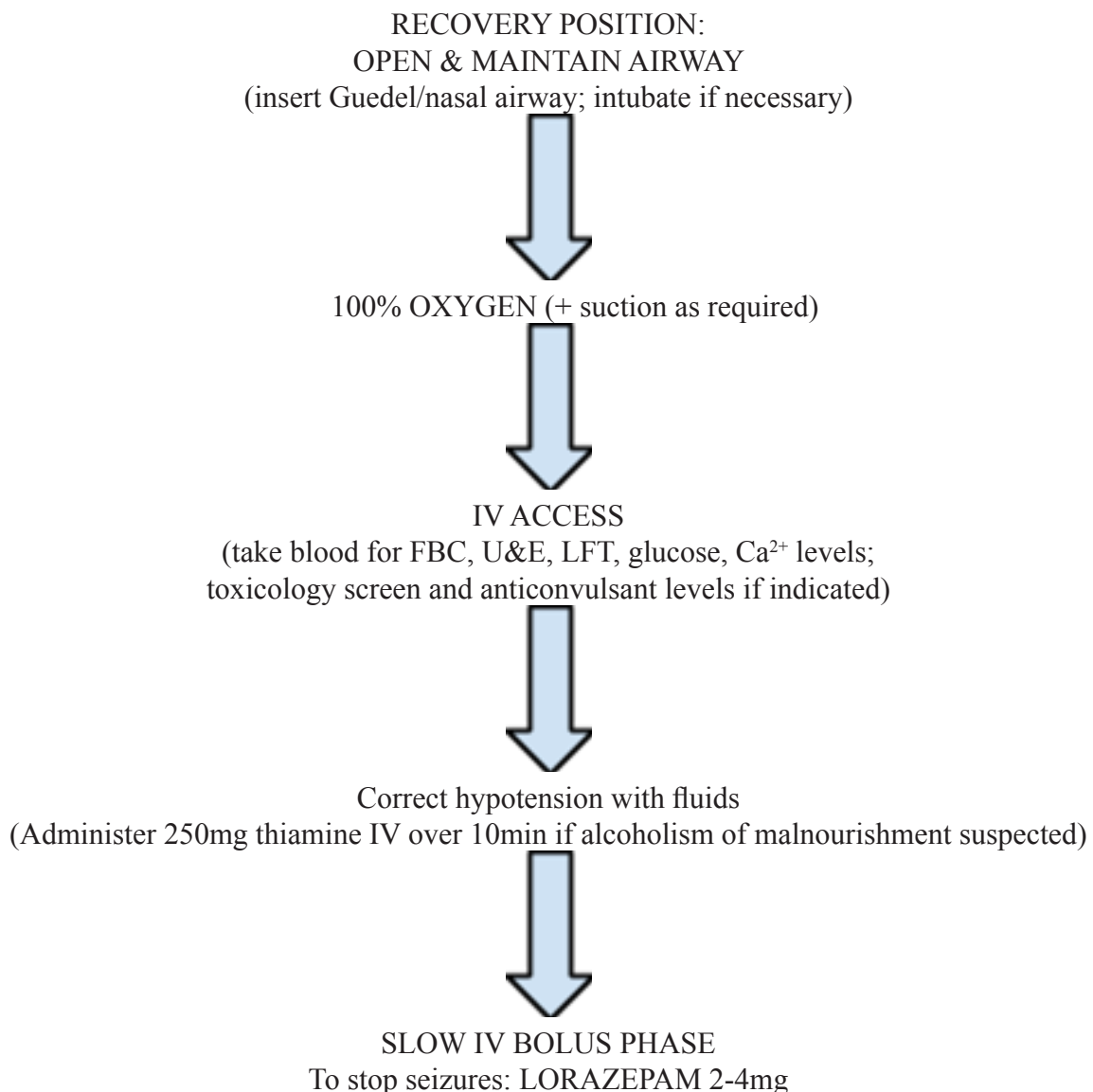
Drug	Dosage	Frequency	Type	Reason
Aciclovir	750mg	TDS	Anti-viral	To treat suspected viral herpes encephalitis
Co-amoxiclav	1.2g	TDS	Antibiotic	Broad spectrum antibiotic in view of possible aspiration
Phenytoin	100mg	TDS	Anti-epileptic	As prophylaxis for subsequent seizures
Perindopril	4mg	Daily	ACE-Inhibitor	To lower blood pressure
Clexane	40mg	Daily	LMWH (low-molecular weight heparin)	Anticoagulant, to act as prophylaxis for DVT

Paracetamol	1g	6-hourly/ PRN	Analgesic	To provide pain relief
Morphine	1mg/mL		Analgesic/Sedative	To provide sedation
Lactulose	15mL	BD	Laxative	Relief of constipation which is a side-effect of morphine
Propofol	10mg/ mL	1 injectable dose	Hypnotic	To provide sedation

Diagnosis:

Status Epilepticus is an acute life-threatening neurological emergency defined as seizures lasting more than 30 minutes or repeated seizures without intervening episodes of consciousness. It generally occurs in known epileptics, thus first presentation should raise a high index of suspicion of the patient having a structural brain lesion. The longer the length of the attack the higher the risk of permanent brain damage as well as an increased chance of mortality. In this case the *status epilepticus* was triggered by a viral infection caused by herpes simplex.

The following is an algorithm illustrating the management of *Status Epilepticus* adapted from ‘Oxford Handbook of Clinical Medicine - 8th Ed.’



(If no response within 2min, give 2nd dose of LORAZEPAM)



IV INFUSION PHASE: START PHENYTOIN
18mg/kg IVI, at a rate equal to/less than 50mg/min
ALTERNATIVE: DIAZEPAM INFUSION: 100mg in 500mL of 5% dextrose
(Monitor ECG and BP; check maintenance doses)



GENERAL ANAESTHESIA PHASE:
If seizures continue, call expert help.
Paralysis and ventilation with continuous EEG monitoring in ITU is required.

Final treatment and follow ups:

No surgical interventions were performed. Treatment on discharge included phenytoin (100mg tds) and perindopril (4mg daily). A repeat MRI head to be done 6 weeks following discharge was booked and an outpatient follow-up arranged.

Fact Box 7:

Abigail Mula

Title: Status Epilepticus (SE)

Short description of condition:

Status Epilepticus is a neurological disorder involving an acute, prolonged epileptic crisis characterised by multiple seizures. It is commonly a result of an exacerbation of a seizure disorder. In this case however this condition is secondary to Herpes Simplex Encephalitis. The virus affects the epileptic-prone regions of the brain, particularly the frontal and temporal lobes, hence the epileptic episodes. Unfortunately SE is a life-threatening condition.

Risk factors:

General:

- Young age
- Acquired brain insults e.g. Herpes Simplex Encephalitis
- Genetic predisposition

Children:

- Fever
- Pre-existing epilepsy
- Cerebral palsy
- Hypoxic-ischemic encephalopathy

Adults:

- History of epilepsy
- Cerebrovascular disease
- Drug intoxication
- Alcohol intoxication
- Head Trauma

Symptoms:

- Imbalance and poor motor control
- Drowsiness
- Unresponsiveness (in severe cases)

Investigation(s) to confirm diagnosis

- CT scan (which would show a high intensity signal in the region of the temporal lobe)
- Electroencephalogram (EEG)
- Lumbar puncture (if aetiology is unknown or patient is immunocompromised)

Prevention

This condition can be prevented by prompt treatment of the seizures. Individuals already suffering from epilepsy, including those on medication must inform the physician if any changes in perception or mood are noted. Moreover, such individuals should limit their alcohol intake. Finally, persons on anti-epileptic medication should undergo regular blood testing.

References:

1. Claassen, J., Bateman, B.T., Willey, J.Z., Inati, S., Hirsch, L.J., Mayer, S.A., Sacco, R.L. & Schumacher, H.C. 2007, "Generalized convulsive status epilepticus after nontraumatic subarachnoid hemorrhage: the nationwide inpatient sample", *Neurosurgery*, vol. 61, no. 1, pp. 60-4; discussion 64-5.
2. <https://www.clinicalkey.com/topics/neurology/status-epilepticus.html>
3. <http://emedicine.medscape.com/article/908394-overview>