



Management of First Epileptic Seizure

Dr. Jason KY Fong FRCP(E), FHKAM (Medicine)

Private Neurologist



Dr. Jason KY Fong

This article has been selected by the Editorial Board of the Hong Kong Medical Diary for participants in the CME programme of the Medical Council of Hong Kong (MCHK) to complete the following self-assessment questions in order to be awarded one CME credit under the programme upon returning the completed answer sheet to the Federation Secretariat on or before 30 April 2006.

There is some controversy regarding hospital admission for first attack of epileptic seizure. One of the clear advantages of hospital admission is speeding up the diagnostic process which may reveal an important or treatable cause. Meanwhile, patients can be closely observed for the possible emergence into status epilepticus, which is the first presentation of epilepsy in about 12% of patients. Finally, important prognostic information can be gathered promptly which are essential for subsequent counselling. In the presence of one or more features listed in Table 1, hospital admission is indicated. Alternatively, evaluation can be performed urgently on an outpatient basis (e.g. the first seizure clinic).

The initial evaluation begins with a detailed history including a witness account and the circumstances at the time of seizure. A preceding aura e.g. epigastric rising sensation, auditory or visual hallucination, *deja vu* is suggestive of a focal seizure onset. In contrast, light-headedness together with dimming of vision and palpitations are likely manifestations prior to syncope. A witness account of limb stiffening, jaw clenching, cyanosis, head and neck version, with or without myoclonic jerks is strongly suggestive of grand mal seizure. Physical examination during the postictal period is usually non-rewarding but some degree of confusion and malaise may be evident. Attention should be paid to the cardiovascular system as syncope is the single most important differential diagnosis (table 2). Certain clinical clues, if present, would support the diagnosis of epileptic seizures (table 3). After a seizure a number of stress hormones are produced which include ACTH, endorphin, cortisol, vasopressin and prolactin. Serum prolactin measurement has been most well studied and considered a useful marker for diagnosing epileptic seizure (table 4). However, it should be interpreted together with observed clinical and EEG events.

There are various causes for a single seizure (table 5). It is important to distinguish group A from group B. Seizures arising from the former are usually self-limiting but the latter are associated with subsequent recurrence and long-term AED may be necessary. In general, a single seizure usually terminates within two minutes and does not require drug treatment. However, short-acting

benzodiazepine (table 6) is indicated under the following circumstances e.g. prolonged grand mal attack more than 2 minutes, remaining drowsy in between attacks, or in the presence of a serious underlying cause. A rapidly acting AED e.g. phenytoin, phenobarbitone or valproate should also be administered at therapeutic doses to prevent recurrence. If seizure remains uncontrolled within one hour, the patient should be transferred to ICU and managed as status epilepticus. The underlying cause requires specific treatment or correction (e.g. correction of biochemical abnormality, acyclovir for herpes encephalitis, surgical drainage for subdural haematoma)..

A neurologist or epileptologist should be consulted whenever possible. Important prognostic information can be obtained via neuroimaging and EEG study (table 7). MRI brain has now superseded CT brain for visualisation of most epileptogenic pathology. Exceptions are those lesions which contain calcium e.g. meningioma, oligodendroglioma or cases related to trauma e.g. bone fracture or haematomas. The presence of a structural epileptogenic lesion is the strongest predictor of future recurrence. A clearly abnormal EEG will increase the chance of recurrence from 20% to 80%. About 75% of persons with an isolated seizure do not have another attack and it is reasonable to withhold treatment until recurrence is established. However, treatment should be considered in patients who have two or more risk factors of relapse (table 8) provided that the benefits of reducing the risk of a second seizure outweigh the risk of pharmacologic and psychosocial side effects. The initial choice of AED is guided by the seizure type, patient characteristics and the side-effect profile of the AED. The Scottish Intercollegiate Guidelines Network provides a useful reference in this regard (figure 1) (1).

For patients who have a normal workup, the cumulative risk of relapse in two years is less than 20% and AED is not recommended. A period of observation (6-12 months) is warranted to determine the recurring tendency. General advice should also be given to patient regarding driving, leisure activity, and lifestyle modification in order to minimise the risk and impact of recurrence (table 9).



Table 1. Indications of hospital admissions for first seizure

1. Fever or signs suggestive of infection
2. Prolonged seizure for more than 5 minutes
3. Recurrent seizures e.g. two grand mal seizures in 24 hrs
4. Incomplete recovery after a seizure e.g. drowsiness for > 2 hours
5. Persistent post-ictal focal neurological deficit

Table 2. Differential diagnosis of epileptic seizures

1. Syncope e.g. neurocardiogenic, cardiac arrhythmia
2. Hypoglycaemia, hypocalcaemia
3. Alcohol, drugs e.g. narcotics, diazepam withdrawal
4. Psychogenic seizures
5. Hyperventilation syndrome
6. Transient ischaemic attack

Table 3. Clinical clues to epileptic seizures

Reliable indicators	Unreliable indicators
1. Lateral tongue biting	Biting tip of the tongue
2. Scald injury	Colles fracture
3. Shoulder subluxation or posterior dislocation	Facial injury
4. Body or limb stiffening	Vertebral fracture
5. Postictal confusion	Myoclonic jerks
	Urinary incontinence

Table 4. Diagnostic utility of serum prolactin measurement

1. Prolactin is elevated in almost all grand mal seizures and most complex partial seizures (except frontal lobe seizures)
2. Prolactin is raised in some simple partial seizures
3. Prolactin is not increased in myoclonus, absence, or akinetic seizure
4. Postictal prolactin should be sampled within 20 minutes after the ictus
5. The elevation in prolactin level should be at least two times above baseline level
6. Physiologic false positives may occur during naps and after nocturnal sleep
7. A normal postictal prolactin level cannot be used to diagnose psychogenic seizure

Table 5. Causes of a single first seizure

Group A. Reactive or systemic causes

1. Reactive seizures triggered by sleep deprivation, fever, drug withdrawal or toxicity.
2. Systemic diseases e.g. infection, hypoglycaemia, hypoxia, hypocalcaemia

Group B. CNS insult or epilepsy

3. Direct CNS insult e.g. head injury, stroke, encephalitis, brain neoplasm
4. First seizure manifestation of symptomatic or idiopathic epilepsy

Table 6. Emergency management of epileptic seizure (grand mal)

1. Remove false teeth, establish a patent airway, and give oxygen by facial mask
2. Assess the patient and place him/her in the left lateral position
3. Give IV diazemuls, or diazepam, or midazolam or lorazepam if seizure continues for more than 2 minutes
4. Give 25 ml 50% glucose IV if haemoglucostix reveals low glucose
5. Give thiamine 100 mg IV if alcoholism is suspected
6. If seizure continues or relapses, give phenytoin 18mg/kg IV at a rate of < 50mg/min. Alternatives are phenobarbitone and sodium valproate.
7. Treat as status epilepticus and transfer to ICU if seizure not under control after 1 hour
8. Carry out diagnostic tests listed in table 4

Table 7. Diagnostic tests for seizure evaluation

1. MRI or CT brain
2. Metabolic screening including electrolytes, glucose, liver function and toxicology studies e.g. alcohol, paracetamol, cocaine
3. EEG
4. CSF analysis only if there is suspicion of intracranial infection

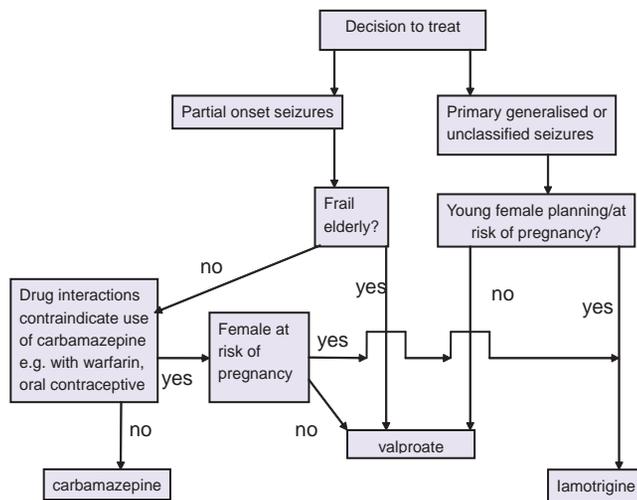
Table 8. Risk factors of recurrence after first seizure

1. Structurally abnormal brain
2. Partial seizure
3. Abnormal EEG
4. Positive family history

Table 9. General advice to patients after first seizure

1. They should stop driving and inform the licencing authority and vehicle insurance company
2. They should not operate dangerous machinery or work at height
3. Caution should be applied for certain at risk hobbies e.g. swimming, hiking
4. Avoid sleep deprivation and alcohol
5. Dietary restriction is not necessary

Figure 1. Initial choice of AED in newly diagnosed epilepsy



References

1. SIGN (2003) *Scottish Intercollegiate Guidelines Network, the Diagnosis and Management of Epilepsy in Adults*. Royal College of Physicians, Edinburgh.



MCHK CME Programme Self-assessment Questions

Please read the article entitled "Management of First Epileptic Seizure" by Dr. Jason KY Fong, complete the following self-assessment questions. Participants in the MCHK CME Programme will be awarded 1 CME credit under the Programme for returning completed answer sheet via fax (2865 0345) or by mail to the Federation Secretariat on or before 30 April 2006. Answers to questions will be provided in the next issue of The Hong Kong Medical Diary.

Questions 1-10: Please choose the best answer.

1. The following are indications of hospital admissions for first seizure except

- Fever or signs suggestive of infection
- Prolonged seizure for more than 5 minutes
- Recurrent seizures e.g. two grand mal seizures in 24 hrs
- Post-ictal headache
- Persistent post-ictal focal neurological deficit

2. For patients presenting with pure loss of consciousness, one should consider the following differential diagnosis

- Syncope
- Hypocalcaemia
- Hyperventilation syndrome
- Transient ischaemic attack
- Both (a) and (b)

3. The following are useful clinical clues to epileptic seizures

- Biting tip of the tongue
- Colles fracture
- Body or limb stiffening
- Facial injury
- Urinary incontinence

4. Regarding postictal serum prolactin measurement,

- Prolactin is elevated in all grand mal seizures complex partial seizures
- Prolactin is not raised in simple partial seizures
- Prolactin is sometimes increased after myoclonus and absence
- Postictal prolactin should be sampled within 20 minutes after the ictus
- A normal postictal prolactin level is suggestive of psychogenic seizure

5. The following are recognised causes presenting with first seizure

- Hyperventilation
- Hypoglycaemia
- Hydrocephalus
- Hypercalcaemia
- Hypercapnia

6. The following tests are useful for seizure evaluation except

- Metabolic screening including electrolytes, glucose, liver function
- EEG
- MRI brain
- CT brain
- Skull X-ray

7. The following drugs may be given to terminate acute seizure

- IV diazemuls
- IV midazolam
- IV phenytoin
- All of the above
- None of the above

8. Which of the following requires drug termination of seizure

- Grand mal seizure for 3 minute
- Absence seizure for 2 minutes
- Complex partial seizure for 3 minutes
- Remaining drowsy between attacks
- both a and d

9. The following factors predict recurrence after first seizure

- Structurally abnormal brain
- Partial seizure
- Abnormal EEG
- (a) and (b) only
- All of the above

10. The following advice should be given to patients after first seizure except

- They should stop driving and inform the licensing authority
- They should not operate dangerous machinery or work at height
- Caution should be applied for certain at risk hobbies e.g. swimming, hiking
- Avoid sleep deprivation and alcohol
- Dietary restriction is necessary



ANSWER SHEET FOR APRIL 2006

Please return the completed answer sheet to the Federation Secretariat on or before 30 April 2006 for documentation. 1 CME point will be awarded for answering the MCHK CME programme (for non-specialists) self-assessment questions.

Management of First Epileptic Seizure
Dr. Jason KY Fong

1 [] 2 [] 3 [] 4 [] 5 [] 6 [] 7 [] 8 [] 9 [] 10 []

Name: _____ HKID No. ____ - ____ X X (x)

Signature: _____ Contact TelNo.: _____

Answers to March 2006 issue

Communication Skills and Doctor Patient Relationship

- 1. T 2. F 3. T 4. F 5. F 6. T 7. T 8. T 9. T 10. F

CALL FOR SUBMISSION OF ARTICLES FOR PUBLICATION IN THE HONG KONG MEDICAL DIARY



The Editorial Board of the Hong Kong Medical Diary invites you to send in your interesting articles for publication in the Hong Kong Medical Diary (500 -1,500 words per article). Abstracts from recent local or international meetings/symposia are also welcome. You can send in your manuscript by facsimile at 2865 0345, through mail or via email at sue.cheng@fmshk.com.hk. The Editorial Board of the Hong Kong Medical Diary will give you a prompt reply.