Neurologist-in-training

The aim of this section is to prepare the neurologist-in-training for the FMH examination, to confront her or him with specific problems of everyday neurological practice, and to give him or her updates on recent controversies in clinical neurology.

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Case vignette

A 21-year-old male student with no medical history was admitted to the emergency room (ER) for a suspected generalised tonic-clonic seizure during sleep. His girlfriend described that she has been alerted by movements of the four limbs, followed by a period of unresponsiveness and agitation. The neurological examination in the ER showed a post-ictal confusional state, without any sign of lateralisation. The head CT was normal and without any contrast enhancement. The electroencephalogram showed paroxysms in the form of spike-waves over the left frontal area, best seen during hyperventilation. The medical history finally revealed the occurrence of a previous and quite similar episode during sleep two years ago. You suspect a partial seizure with secondary generalisation during sleep with a left frontal onset and decide to introduce an antiepileptic drug (AED).

MCQ

1. *Which of the following AEDs is not indicated in this case?*

A Carbamazepine
B Sodium valproate
C Levetiracetam
D Lacosamide
E Lamotrigine

The patient is taking carbamazepine slow release titrated to 400 mg twice a day. Unfortunately, he presents an increase of seizure frequency, always during the night. The neurological status is normal. After three months, repetition of the EEG during the day shows the persistence of epileptiform patterns over the left frontal area.

2. *What do you think is the least appropriate action to do at this stage?*

A To increase the dose of carbamazepine
B To change to another AED
C To repeat the head CT
D To do a cerebral MRI
E To order a long-term (overnight) EEG

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Before reconsidering the medication, you order a long-term EEG that shows generalised spike-waves epileptiform activity, more pronounced over frontal regions bilaterally. The cerebral MRI is normal. You decide to change the treatment, suspecting generalised idiopathic epilepsy.

3. *Which of the following treatment is not appropriate?*

A Topiramate
B Sodium valproate
C Lamotrigine
D Levetiracetam
E Oxcarbazepine

On valproate, the patient is seizure-free and the EEG becomes normal.

Two years later, on a routine examination, the patient describes the resurgence of generalised seizures during the night. The physical examination is normal, except for a tendency of irritability that you had not noticed before. The report of the EEG that you just ordered mentions the presence of a slow and continuous left frontal focus with some superimposed epileptiform activity.

4. *What do you suspect?*

A A drug-induced encephalopathy
B A structural left frontal brain dysfunction
C A lack of compliance with the medication
D A mistake in the EEG interpretation
E A worsening of the generalised idiopathic epilepsy

You keep the medication of valproate and add small amounts of lamotrigine. Alerted by the behavioural and EEG changes, you order a head CT (cf. figure 1).

5. *What is your first diagnostic impression after looking at the image?*

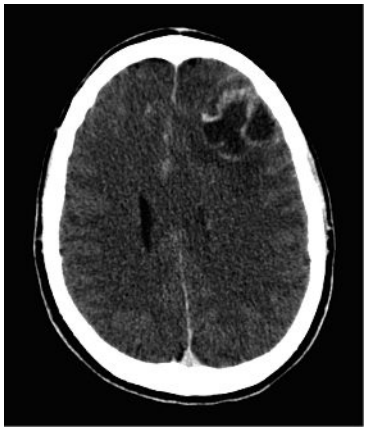

Figure 1
Head CT after contrast injection.

A Cerebral tumour
B Focal cortical dysplasia
C Arachnoid cyst
D Post-traumatic brain contusion
E Sub-acute stroke

The neurosurgeons perform a complete resection of the left frontal lesion. The histopathology confirms the diagnosis of a cystic glioblastoma. The patient has no residual neurological deficit. He receives oncologic treatment of radiotherapy and chemotherapy (temozolomide). The patient is free of seizures and the EEG shows a disappearance of epileptiform activity. You keep him on valproate and stop the lamotrigine. Six months later, the patient asks you about his aptitude to drive a car.

6. Which attitude seems the least appropriate?

A You order a neuropsychological test.
B You allow him to drive one year after the last seizure without any limitation.
C You propose to reconsider his request 12 months after the last seizure.
D You ask a driving instructor to do a driving test in traffic in 6 months.
E You propose to wait for the oncologic follow-up.

Answers to MCQ

1: D; 2: C; 3: E; 4: B; 5: A; 6: B

Comments

MCQ 1

All the proposed AEDs can be used for partial seizure types with or without secondary generalisation. Lacosamide (Vimpat®) is approved by Swissmedic only as an add-on therapy, and not as a monotherapy, as opposed to the other AEDs listed.

MCQ 2

The neurological examination was normal and the patient has already had a head CT. The value of another CT would be close to zero. However, we suspect a focal abnormality that could be best revealed by a brain MRI. Due to the occurrence of nocturnal seizures only, an overnight EEG is also indicated, to look for an activation of focal epileptiform activity versus generalised discharges that would suggest primary generalised epilepsy (stage I and II of sleep). Generalised discharges are sometimes expressed as pseudo-focal spikes. For the medication, it is possible to either increase the carbamazepine doses (to the maximal tolerated dose) or to change to another AED, for example one of the drugs given in MCQ 1 (except for lacosamide, if one aims for monotherapy).

MCQ 3

The EEG strongly suggests idiopathic generalised epilepsy. The recommended AEDs for generalised idiopathic epilepsy are valproate, levetiracetam, topiramate and lamotrigine. Oxcarbazepine is not useful in primary generalised epilepsy. It is important to keep in mind that lamotrigine can induce an exacerbation in juvenile myoclonic epilepsy but the drug is still worth a trial in this condition. In young women who want to become pregnant, valproate and topiramate should not be chosen because of an increased risk of teratogenicity.

MCQ 4

At this stage, we have two new elements: behavioural changes and the apparition of a left frontal focalised slowing on EEG. An AED encephalopathy, as seen with valproate, phenytoin, carbamazepine, or more seldom with vigabatrine, lamotrigine and topiramate, would induce a confusional state, a reduction of vigilance and a diffuse slowing of EEG activity. A lack of compliance with total withdrawal from AED would not result in a focal slowing, but in resurgence of the previous epileptiform discharges. The risk of misinterpretation of the EEG, even by an experienced electroencephalographer, is reduced if the clinical situation is taken into account. An aggravation of generalised idiopathic epilepsy would not result in a focal slowing.

MCQ 5

The cystic lesion with lobulated contrast enhancement is highly suggestive of a primary/secondary brain tumour. A focal cortical dysplasia is a static lesion that does not show contrast enhancement and is usually not detected on CT. The image is not suggestive of an (extra-axial) arachnoid cyst. The medical history is not suggestive of a head trauma. Subacute stroke would not result in a cystic lesion.

MCQ 6

Here, the ability to drive is limited by the epilepsy, the cognitive dysfunction as well as the underlying oncologic condition. In this patient with active epilepsy, the ability to drive a car for private purposes requires at least 12 months without seizure. A neuropsychological test focusing on driving-related abilities (especially executive functions and attention, possibly compromised by the large frontal lesion) is mandatory in this case as well as the stability of the oncologic condition. A driving test could be useful in order to verify aptitude.

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