

SUMJ Clinical Feature

Transient loss of consciousness - first ever seizure? Tips for the Acute Receiving Unit

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ABSTRACT

Transient loss of consciousness (TLOC) in adults is a common presenting symptom to the Acute Receiving Unit, with an epileptic seizure a potential cause. A first ever generalised epileptic seizure is not uncommon, with a lifetime prevalence of approximately one in 20 people. However, as epileptic seizures are only one cause of TLOC, it is important for doctors to be able to distinguish between seizures and the other causes of TLOC. In this article we provide practical advice on how to do this.

Key Words: Neurology; Fits faints and funny turns; Epilepsy

Introduction

Transient loss of consciousness (TLOC) is a frequent presenting complaint in the Acute Receiving Unit (ARU). The definition of TLOC is, as the name suggests, a loss of consciousness with subsequent recovery. There are many causes of TLOC, but about 10% are due to epileptic seizures¹.

An epileptic seizure can be defined as a “transient occurrence of . . . symptoms due to abnormal excessive or synchronous neuronal activity in the brain”². The diagnosis of epilepsy requires a recurring tendency to suffer unprovoked epileptic seizures. Epileptic seizures are common: up to 5% of the UK population will have at least one non-febrile seizure during their lives³. Epilepsy is less common, with a point prevalence of 4 in 1000 people in the UK; thus a significant proportion of patients presenting with a first ever seizure do not develop epilepsy⁴. The International League Against Epilepsy (ILAE) divides seizures into focal (arising from a single cerebral hemisphere) or generalised (arising from both cerebral hemispheres)⁵.

Table 1 lists common types of epileptic seizure.

The differential diagnosis of TLOC in an adult is summarised in table 2 (as adult neurologists, we will not cover paediatric causes of TLOC but refer readers to SIGN guideline 81⁶). It is

important to identify, wherever possible, the correct cause of TLOC; a false positive diagnosis of an epileptic seizure may lead to inappropriate investigations and treatment, and prevent identification of an equally important diagnosis such as cardiac syncope.

The diagnosis of epileptic seizure/epilepsy has many implications: it is important to be as sure as one can in making this diagnosis, and therefore this should usually be deferred to an expert. It is better to be uncertain than to reach an incorrect diagnosis – and sometimes it is not possible to make a diagnosis – but provided a careful history is obtained, a correct diagnosis can be achieved in many.

Table 1: Common Types of Epilepsy Syndromes

Generalised seizures (involving whole brain)	
<i>Tonic-clonic</i>	Initial sustained muscle contraction/rigidity (tonic) followed by rhythmic muscle contractions (clonic). May be predominantly tonic or clonic
<i>Absence</i>	Brief periods of unresponsiveness, with no or minor motor activity (e.g. eyelid flickering)
<i>Atonic</i>	Abrupt loss of muscle tone, causing drop attack
<i>Myoclonic</i>	Brief muscle contractions causing sudden shock-like jerks, may manifest as suddenly dropping things or falls
Focal seizures (involving specific areas of the brain, typically stereotyped)	
<i>Temporal lobe</i>	<ul style="list-style-type: none"> 'Rising' feeling in stomach Unusual smell or taste Intense unprovoked emotion (e.g. fear) <i>Déjà vu</i> or <i>jamais vu</i> Automatisms such as lip-smacking, chewing, muttering, fiddling with (imaginary) objects
<i>Frontal lobe</i>	<ul style="list-style-type: none"> Stiffness or twitching of part of the body (e.g. arm) Bizarre patterned motor activity (e.g. cycling of legs)
<i>Parietal lobe</i>	<ul style="list-style-type: none"> Numbness or tingling of part of the body (e.g. arm)
<i>Occipital lobe</i>	<ul style="list-style-type: none"> Visual disturbances (e.g. flashing lights) Hallucinations
Focal seizures may evolve into a (secondary) generalised seizure and may or may not affect awareness (previously known as complex or simple partial seizures respectively). Total loss of consciousness is unusual in focal seizures	

Table 2: Other causes of syncope

1- Cardiac syncope
2- Vasovagal syncope: reflex syncope, orthostatic syncope, and convulsive syncope
3- Dissociative attack (also known as: psychogenic non-epileptic seizure, non-epileptic attack, pseudo-seizure)
4- Metabolic (e.g. hypoglycaemia)

History

A thorough history is of paramount importance in diagnosing what was, or was not, a seizure. Although the patient may be unable to recall all the circumstances of the event, you should ascertain what he/she *does* remember, and this may require persistence; patients will often say they remember nothing, not realising that there is more to the history than simply the period of loss of awareness. A witness history is essential whenever possible - use the telephone to pursue this if witnesses are not immediately present. Meticulous documentation of the history in the notes will earn the gratitude of the neurologist later, and the most accurate histories are usually those obtained soon after the event, before memories decay. The history of the event should be divided into three segments: before, during, and after. Case studies 1 and 2 give details of two presentations using this approach (see page x).

Before the event

The situation may well prompt a diagnosis - where was the patient and what they were doing? For example, most people who lose consciousness in a restaurant, cinema, hospital, GP/dental surgery, bathroom, or on an aeroplane have fainted, whereas TLOC whilst exercising suggests cardiac syncope. Fainting is very unusual in bed (i.e. when horizontal), but is usually the explanation when TLOC has occurred after getting out of bed in the night. Other common triggers of TLOC such as sleep deprivation, alcohol withdrawal, or use of recreational drugs (all suggesting provoked seizure), or intercurrent illness, particularly vomiting and diarrhoea (suggesting fainting) should be identified. Some questions (i.e. recreational drug use or pregnancy) may be best asked out of earshot of witnesses, especially parents – we do this by observing the patient walking down the corridor as part of the examination, and asking them before returning to the clinic room.

Does the patient recall any warning before the event? A focal seizure may produce brief (typically less than 60 seconds) sensations that may be difficult for the patient to describe. These sensations vary but common manifestations are listed in Box 1. Witnesses may also provide useful pre-TLOC information – automatisms such as lip-smacking/swallowing/chewing, plucking at (imaginary) objects, or trance-like absence all suggest a focal onset of a seizure.

Vasovagal (or reflex) syncope (fainting) usually has a trigger – commonly pain or other unpleasant stimuli – hence the propensity to occur in hospital/surgeries, especially during procedures such as venepuncture. Patients may complain of feeling ‘faint’, sweaty, clammy, and sick, and their vision/hearing may diminish prior to TLOC. Dissociative attacks may also

be preceded by a stressful trigger, although not always. Beware of TLOC with no apparent trigger or warning, as this may suggest cardiac syncope.

During the attack

Generalised epileptic seizures usually start abruptly with tonic stiffening (sometimes accompanied by a 'tonic cry') and progress to rhythmic jerking movements. The eyes may be open, the lips may become pale or blue, and patients are unresponsive. The convulsive phase rarely lasts longer than a couple of minutes, although witnesses commonly overestimate duration.

Vasovagal syncope may be accompanied by motor activity (stiffening, twitching or jerking) that can mimic an epileptic seizure (known as convulsive syncope), as demonstrated in a series of experiments on German medical students⁷. These movements are usually brief, lasting for less than a minute, often only seconds.

Dissociative seizures are highly variable but there are certain features that help distinguish these from epileptic seizures. Large amplitude asynchronous movements such as arm flailing or pelvic thrusting are characteristic, often waxing and waning over prolonged periods of time. Alternatively the patient may lie motionless, as if asleep. The eyes tend to be closed, and may resist forced opening. Dissociative attacks often have a long duration (10-30 minutes, or even hours). Patients may be able to recall events occurring during an attack and sometimes report dissociative phenomena such as depersonalisation. Unfortunately witness descriptions may be misleading, so obtaining video footage (increasingly easy nowadays given the ubiquity of the mobile phone with video-capturing ability) in recurrent attacks may prove exceedingly valuable.

Patients with cardiac syncope often collapse with no warning, and lie motionless, perhaps paler than usual, with rapid recovery thereafter. TLOC during exertion should always prompt consideration of cardiac syncope, and always ask about a family history of young sudden death or heart disease.

After the attack

After an epileptic seizure patients are typically confused and may even be aggressive (the post-ictal phase). There is usually a period of amnesia that may be prolonged – patients tend to 'come round' in the ambulance or emergency department, even though the witness history confirms earlier regaining of consciousness if not awareness. Patients are often initially unable to recognise partners/friends/colleagues, and this is an important question to ask witnesses (by contrast, people frequently say they felt confused after a faint, but this is not quite what they mean). Patients subsequently complain of generalised muscle ache or headache. Unilateral bite injuries to the side of the tongue are highly suggestive of generalised tonic-clonic seizures⁸, as are certain other less common injuries such as shoulder fracture and/or dislocation. Todd's paresis (post-ictal limb weakness) may be present, although this is not specific: functional weakness is frequently preceded by a dissociative attack⁹. Urinary or faecal incontinence are not specific for epileptic seizures and barely worth asking about. Patients with syncope – either vasovagal or cardiac –recover quickly

without true confusion or disordered behaviour as seen in the post-ictal phase, although some patients feel exhausted and fatigued for some time after a faint.

Past medical history

The remainder of the history should not be neglected, with emphasis on drugs – including over-the-counter and recreational drugs – and alcohol. A recent head injury should prompt consideration of subdural haematoma or other intracranial bleeding, especially in patients taking anti-thrombotic drugs. Recent overseas travel means infections not found within the UK may enter the differential. A history of cancer – particular cancers that metastasise to brain, such as lung, breast, or melanoma¹⁰ – is also important. You should ask about developmental and childhood history (in particular, if there were any febrile convulsions), the family history, and any suggestion of previous seizures (e.g. multiple unexplained blackouts or other funny turns).

Examination

Examination often provides few diagnostic clues (if any) and the history is of far greater importance. Your time will be better spent telephoning a witness than pursuing a rushed neurological examination. Taking the pulse and auscultating the heart are important, especially if the history suggests syncope. Whilst a detailed neurological examination may reveal focal signs suggestive of an underlying structural lesion, you should have decided by the end of the history whether referral to a 'First Seizure' Clinic is merited. The presence of persisting abnormalities such as fever, rash, drowsiness, headache, or other focal signs indicate a need for admission for more urgent investigations.

Investigations

All patients with suspected seizure should have basic blood tests. The white cell count is often elevated post seizure (and rarely indicates underlying infection), but the CRP is unlikely to be significantly elevated unless there is a concomitant infection¹¹. A 12-lead electrocardiogram (ECG) is essential for all patients presenting with TLOC. Table 3 lists mandatory and optional investigations for a suspected first seizure. Decisions regarding specialist investigations such as EEG and brain imaging are usually best deferred to the First Seizure clinic, but occasionally urgent brain imaging (usually CT in the first instance) is warranted (Table 4).

Table 3: Investigations for TLOC

Mandatory

FBC, U&Es, glucose, LFTs (including gamma GT if suggestion of alcohol excess), calcium
12-lead Electrocardiogram

For consideration

Toxicology screen: urinary drugs testing, blood alcohol level
Chest radiograph (if aspiration or infection suspected)
CT head (see table 4)
Pregnancy test
24hr electrocardiogram/ echocardiogram

Table 4: Indications for urgent CT head after TLOC

1- Persisting significant focal neurological deficit or confusion/decreased awareness
2- Recent head injury (especially if anti-coagulated)
3- Recent diagnosis of malignancy likely to metastasise to brain (e.g. lung, melanoma, breast)

Treatment

TLOC with full recovery does not usually require treatment. Defer the decision to commence anti-epileptic drugs (AEDs) to a specialist; there is rarely an indication for urgent initiation of an AED but if you think this is the case then discuss this with the on-call neurologist first. Treatment of status epilepticus is beyond the scope of this article¹².

Follow-Up

All patients with possible or suspected seizures should be referred to an appropriate clinic, ideally a rapid access First Seizure clinic. The SIGN epilepsy guidelines (SIGN 70) state that the patient should be reviewed by a specialist within 2 weeks¹³. Different hospitals have different pathways to achieve this, and you should become familiar with the protocol within your own hospital. If there is none, then you should be asking (loudly) why not!

Patients with a secure diagnosis of vasovagal syncope do not need specialist referral unless there are diagnostic doubts or the episodes are frequent. Patients with suspected cardiac syncope require an urgent cardiology opinion.

Driving regulations are available from the DVLA website¹⁴, but anyone who has had a TLOC which is not due to a simple faint is legally obliged to inform the DVLA, and your job as a doctor is to remind them of this legal duty. A first ever seizure will lead to a 6 month suspension for Group 1 licences, but recurrent seizures increase this to 12 months. Group 2 (HGV) drivers have more stringent regulations. Patients should *always* be informed of the relevant regulations and you must document this in the notes.

Advice to Patients

TLOC often causes great concern amongst patients and carers. Therefore you should provide an explanation of your diagnosis wherever possible, with reassurance where appropriate (e.g. fainting). If you are referring on to a specialist, explain why, and how long they might have to wait (but be realistic - do not say next week if you know this is unlikely to be the case!). Remember that patients may have impaired memory in the aftermath of a seizure – even if they appear alert – and that providing written information is worthwhile (and copying your subsequent clinical letter to the patient will further enhance good communication). Some aspects to consider when speaking to patients are as follows:

- Seizures are common: up to one in 20 people (5%) of people will suffer at least one epileptic seizure in their lifetime
- Having one seizure does not mean epilepsy
- Consider driving advice; if you are unsure, or suspect anything other than a faint, recommend they do not drive until after further specialist assessment

- Avoid situations that could be dangerous: e.g. working at height, using heavy machinery, or swimming unsupervised

Many hospitals have their own information sheets but epilepsy charities also provide leaflets or online information^{15 16}. Patients often have concerns regarding the impact of advice – particularly driving regulations - on their work and home lives. It can help to give the patient a copy of the discharge letter with the advice included so that it can be given to their employer.

Patients may ask whether having a seizure means that they have epilepsy. Since epilepsy is defined as a tendency to recurrent seizures then it is clear that a diagnosis of epilepsy cannot be made after a single seizure. About half of patients presenting with a first ever seizure will develop epilepsy within the next 2 years¹⁷.

Summary

TLOC is a common presentation to the ARU. Most of these patients have benign diagnoses (mainly vasovagal syncope) but some will have had an epileptic seizure. The diagnosis can be challenging and there is often an element of uncertainty, even after an expert opinion has been sought. A thorough history from both patient and witness is the only way to reach as accurate a diagnosis as possible, as investigations rarely reveal what might have happened.

It is important to give the patient an explanation of what you think caused their symptoms. Do not make a diagnosis if you are uncertain and remember that epilepsy cannot be diagnosed after a single seizure. If you suspect that your patient has had a seizure, or do not know how to adequately explain their TLOC, then you should refer the patient for further specialist opinion.

Case Histories

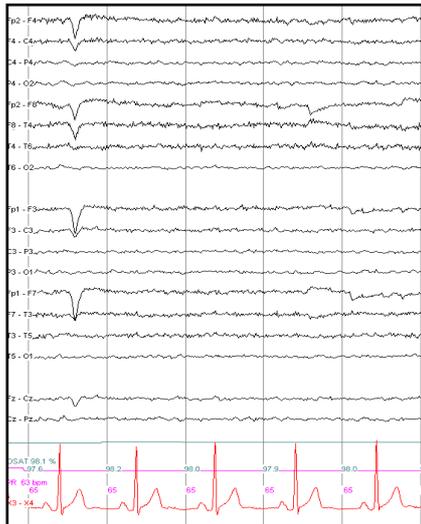
Case History One

An 18 year old girl presented with TLOC. She had gone to bed late the preceding night after clubbing. Her recollection was limited to vaguely recalling going to bed, and then awakening in the Emergency department with a headache, a bitten tongue, and sore arms and legs which persisted for 2 days. Her mother was alerted by a loud ‘thump’ in the morning and found her daughter rigid and unresponsive on the floor with blue lips, progressing to jerking of all four limbs, lasting for about two minutes. Afterwards she was confused, did not recognise her mother, and fought the paramedics when they tried to apply an oxygen mask. On direct questioning, she and her mother agreed that for at least a year they had noted frequent sudden twitchy jerks, usually of her arms, and usually in the mornings. Indeed her morning “clumsiness” had become something of a family joke, and her mother thought it was simply part of being a teenager who disliked early starts. When seen in the First seizure clinic a week later, it was thought the likely diagnosis was juvenile myoclonic epilepsy - an idiopathic generalised epilepsy syndrome that typically presents with early morning myoclonic jerks (sometimes with absences as well) and eventually leads to tonic-clonic seizures. The diagnosis was confirmed with an EEG (Figure 1). In this case, the easy part of

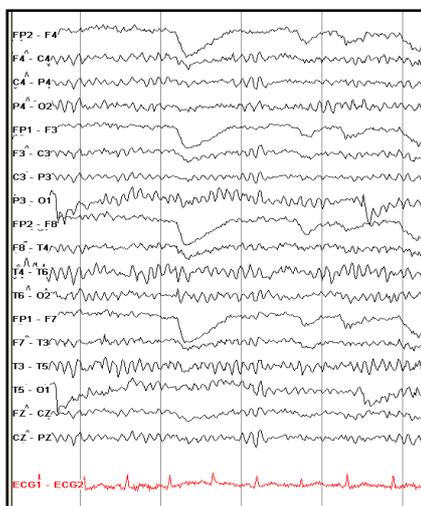
the diagnosis was recognising the hallmarks of the tonic-clonic seizure, but equally important was the identification and recognition of the preceding myoclonus, which altered the diagnosis from an isolated seizure to one of epilepsy, with important therapeutic implications.

Figure 1

1A: Normal EEG (with eyelid artefact occurring near start of trace)



1B: EEG from Patient 1, revealing generalised epileptic discharges consistent with generalised epilepsy such as juvenile myoclonic epilepsy (eventual diagnosis in Patient 1)



Case History Two

A 70 year old woman presented with TLOC. She had been on a cruise and had contracted “winter vomiting virus”. She recalled getting up from the toilet, feeling hot/cold/clammy and sweaty, and then waking up on the floor of the cabin and hearing her husband frantically trying to reach the operator on the telephone. Her husband noted her to stagger out of the toilet, and then collapse to the floor, whereupon she briefly twitched and jerked for perhaps

10 seconds. The husband described this initially as a fit and had to be coaxed into providing more detail, which clarified that the events were more like brief asynchronous and short-lived myoclonic jerking than the rhythmical, more prolonged jerking typical of an epileptic seizure. He said she was “white”, and after the twitching stopped, he thought she had died, as all movement ceased briefly; whilst he was on the telephone she suddenly called his name and regained awareness, before vomiting. She had a bump over her forehead but no other injuries. She was evacuated from the ship by helicopter after the exhausted ship’s doctor thought she had experienced a convulsion secondary to sepsis. Retrospective review of the history suggested that this was most likely to have been a convulsive reflex syncope in association with norovirus infection, which required no further investigation, and she was able to retain her driving licence. It is very useful to extract the suggestion that a witness thought the patient had “gone”; this almost always means syncope not seizure (although witnesses may worry that a patient having a seizure might be *dying*, it is rare that they think they have actually died as this implies complete lack of movement, which is much more common in syncope). Such questioning requires tact and sensitivity, as it is frequently distressing for both the witness and patient to recall, but constitutes very useful diagnostic information.

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