

Review Article

Transient Loss of Consciousness (TLOC) — A Low-risk High Stakes Condition that Every Physician Must Know How to Manage

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Transient loss of consciousness also known as TLoC is a common reason for presentation in the Emergency Department and in General Practice and accounts for 3-5% of Emergency Department presentations. The incidence sharply increases with age. Finding the underlying cause after a single episode can be challenging particularly as patients recover fully by the time they are brought to medical attention. A systematic assessment including a detailed history from the patient and a witness are extremely important. A detailed clinical examination and a judicious use of investigations are key to the management of this low risk but high stakes condition. There are a number of risk stratification tools and scores that can be used to aid in identifying those at high risk of death and needing further investigation and treatment. Some patients presenting with TLoC are unnecessarily investigated and in as many as half of the cases the diagnosis of the underlying aetiology remains unclear despite multiple investigations. It is important that clinicians assessing patients with TLoC are aware of the driving regulations as guided by the DVLA in UK and provide these patients with appropriate advice while they get investigated.

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Key words : Transient Loss of Consciousness, TLoC, Syncope, Risk Stratification.

Transient Loss of Consciousness (TLoC) is defined as an abrupt loss of consciousness of short duration that is followed by a spontaneous and complete recovery. Almost half of the patients in UK do not get a diagnosis for an underlying cause and the burden on the NHS with the costs of investigations are very high¹. Patients often describe episodes of TLoC as “Blackout” or “Collapse” but some people can have collapses without any loss of consciousness and should not typically be described as TLoC. Up to 6% of emergency admissions in hospital and 3-5% of Emergency Department presentations can be due to TLoC². It is particularly common in patients over the age of 65 years and in this group syncope and seizure are most common.

The diagnosis of the underlying cause of TLoC can be challenging to physicians and can result in delay in correct diagnosis and effective treatment. For example, a patient with a cardiovascular cause for TLoC may be treated for epilepsy for several years before it

Editor's Comment :

- An important cause of TLoC in the elderly is orthostatic hypotension secondary to prescribed medications.
- Cardiological causes are more common than neurological causes of TLoC and carries a high risk of death.
- Use of risk stratification scores like the Canadian Syncope Risk Score, FAINT Score, OESIL Score or the San Francisco Rule can be useful to determine those who needs hospital admission or at risk of death.
- ECG is mandatory for almost all patients with syncope to look for cardiac causes.
- Any patient with murmur with syncope needs echocardiography
- All patients in UK must be given driving advice as per the DVLA recommendations.

is identified correctly. Sometimes patients can end up having several inappropriate tests and are referred to the wrong specialty resulting in wastage of valuable healthcare resource and patient dissatisfaction. Sometimes delay in diagnosing significant and dangerous cardiac dysrhythmias may result in death and severe morbidities and long-term disabilities.

Classification :

There are two main groups of TLOCS – TLOC due to head trauma and TLOC due to non-traumatic causes. This review will cover the non-traumatic causes of TLOC and will henceforth be referred as TLOC. There are four major causes for non-traumatic TLOC and in order of their frequency are (1) Syncope, (2) Epileptic Seizures (3) Psychogenic and (4) Other Rare causes (Fig 1). Sometimes the term pre syncope or faint is

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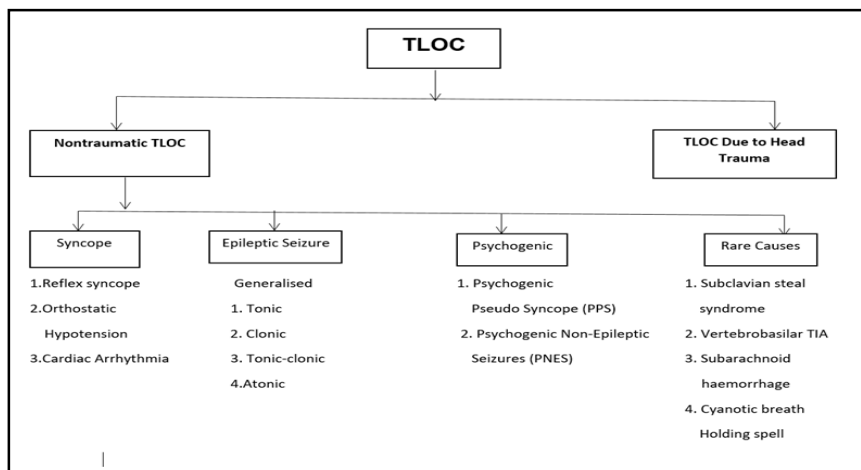


Fig 1 — Classification of TLoC according to the underlying cause

difficult to elicit the trigger and hence history taking is extremely important in TLoC. Orthostatic Hypotension causing syncope is most commonly drug induced (especially in the elderly) but can also occur due to autonomic failures (both primary and secondary) or due to volume depletion. The typical history of a positional syncope of orthostatic hypotension is syncope while standing up from lying or sitting postures and the final pathway is the failure of the autonomic nervous system to changes in the posture.

used to describe the prodrome where there is no loss of consciousness. The Framingham study found that 30 % of patients with syncope has more than one episode but the diagnosis of TLoC when patients present for the first time can be challenging.

Pathophysiology :

The major headings under which the causes of TLoC are classified in Fig 1 is based on the pathophysiology of each. The underlying mechanism for (a) syncope is cerebral hypoperfusion (b) epileptic seizures is excessive brain activity and (c) psychogenic causes is the process of conversion. Syncope occurs because of a global decrease in blood flow in the brain. A sudden reduction of cerebral blood flow for as short as 6-8 seconds can cause syncope. In upright position a systolic BP of 50-60 mmHg at heart level or 30-45 mmHg at brain level will cause syncope^{4,5}. Of the different causes of TLoC 92 % are due to syncope while 6% are due to non-syncopal causes. In about 2% cases the cause of TLoC is unknown. Syncope can be "neurally mediated" and include vasovagal episodes, carotid sinus hypersensitivity and situational syncope. In neurally mediated syncope there is triggering of a "reflex response" that causes sudden vasodilatation and bradycardia either alone or in combination. In vasovagal syncope often the trigger can be emotional stress or due to prolonged standing in a closed place. In carotid sinus hypersensitivity the symptoms can be reproduced sometimes by manipulation and massaging the carotid sinuses that can elicit a vasodepressor response. The situational syncope includes physiological activities like micturition, cough, defaecation or swallowing. Sometimes it may be

in the cardiac output and results in cerebral hypoperfusion. They are a common reason for emergency hospital admission and death and includes both brady and tachyarrhythmias. Common brady arrhythmia include sick sinus syndrome, advanced AV blocks. While common tachyarrhythmias include both ventricular and supraventricular tachyarrhythmias. Inherited long QT syndromes like Brugada Syndrome (Fig 2) and implanted devices like ICD and Pacemaker malfunction can sometimes cause syncope. Structural diseases of the heart and lung cause syncope due to cerebral hypoperfusion where the diseased heart and lung cannot cope with the increased demands put on them and commonly occurs during exercise. In this group, hypertrophic obstructive cardiomyopathy (HOCM), severe aortic stenosis, myocardial infarction and severe pulmonary hypertension can cause syncope



Fig 2 — Typical ECG of a patient with Brugada Syndrome (characterised by coved >2mm ST elevation in V1-V3) that can cause syncope or sudden cardiac death in someone with a structurally normal heart

and sudden death in a small number of cases. Rare causes include Steal Syndromes where blood is diverted away from the brain because of obstruction of blood vessels (example subclavian steal syndrome).

In Non-Syncopal causes of TLoC the mechanism is not due to cerebral hypoperfusion but because of other reasons like increased electrical activity in the brain or breach in the physiological neural pathways. Common non syncopal causes for TLoC are epilepsy, metabolic causes like hypoglycaemia or hypoxia, intoxications with drugs or alcohol, psychogenic, drop attacks, vertebrobasilar Transient Ischemic Attack (TIA) and falls⁶.

Presentation :

Patients may present to their general practice or in the emergency department after a fall and or injury, they may have sustained trauma secondary to the fall and other accident and the prodrome of the fall may be forgotten. Mechanical falls should be the last diagnosis thought of especially in the elderly population presenting with TLoC.

Investigation :

A clear and complete history should be taken including past medical and family history with any recent medication changes. If possible collateral history and eyewitness of the event can be invaluable including paramedic information sheets. Special attentions should be taken to elicit the prodrome and postdrome of the event. Posture and activities before the index episode can point in the direction of postural and reflex cause of symptoms (for example sitting to standing, micturition or defecating). It should be noted that it can take up to three minutes for the systolic pressure to drop in orthostatic hypotension. One should ask the questions – (a) has there been a history of palpitations to suggest an arrhythmia? (b) was the repallor to suggest hypotension and or cardiac cause? Myoclonic jerks and incontinence are not a reliable sign of an epileptic event as this can occur with reflex syncope⁷. In recovery if there is a period of prolonged confusion and or postictal state with tongue biting this may well suggest an epileptic cause.

Facial injuries sustained to the patient are strong suggestions of loss of consciousness while claims of multiple falls and syncope with no apparent injuries may suggest a psychogenic cause. This can be collaborated by the witnesses of the syncope or seizure.

Capillary Blood Glucose : Is an important investigation in the Emergency Department for anyone with a transient loss of consciousness though it is

unlikely that they would fully recover without any glucose given to the patient during or after episode.

ECG : All patients should have an ECG and if this is normal then there is a low risk of serious cardiac cause for the TLoC. Heart block and bradycardias all require admission to further investigate. Non sustained tachyarrhythmias such as Atrial Fibrillation may only require rate control and a short period of observation before discharge.

Lying and standing blood pressure⁸ : This should be performed at 0, 1 and 3 minutes when erect to ensure that a delayed hypotensive event has not occurred.

Bloods : Full blood count and or urea and Electrolytes to rule out biochemical causes of an arrhythmia such as hypokalaemia and other rule out tests such as a D-dimer if a pulmonary embolus is suspected.

Echocardiography : If there is a history of syncope post or during exercise then an echocardiogram and exercise tolerance test specifically looking for a left ventricular outflow tract obstruction (Fig 3) and or arrhythmia should be sought.

Cardiac Monitoring : A history of palpitations may require cardiac monitoring and if their ECG is normal and depending on the frequency of attacks 48 hours to 7-day Holter monitoring may be required. If there are still episodes of TLoC and a cardiac cause is suspected then implantable loop recorder⁹ can help in the diagnostic pick up of cases.

Management :

The management of a patients with TLoC can be challenging because by the time they see a clinician they have fully recovered. The job of the Emergency Physician or the General Practitioner is to discharge those who are low risk and at the same time identify



Fig 3 — Echocardiogram of a patient with Hypertrophic Obstructive Cardiomyopathy with Dynamic Left Ventricular Outflow Tract (LVOT) obstruction

those who are high risk and need further investigations and hospital admission. The management of TLOC greatly depends on the cause of loss of consciousness, with specific management depending on the cause (Fig 4).

Tachyarrhythmias may require rate limiting drugs while heart blocks and significant pauses (greater than 3 seconds) in ECG will require pacemaker insertion⁹.

Orthostatic hypotension may require medication review and consideration of altering the drugs depending on the utility of each medication and the risk of harm with further collapses e.g. the treatment of hypertension and cardiovascular risk vs syncope and falls. Fluid loading can help with some cases with the addition of fludrocortisone in selected cases¹⁰.

Driving :

Depending on the diagnosis and the risk of occurrence the patient may have to suspend driving and inform their licensing body. In the UK there are clear guidelines published (by the DVLA and accordingly advice can be given to the patient¹¹. If the patient drives, failure to warn the patient to stop driving, may cause harm to themselves or the public if there is an episode of syncope or seizure while operating a vehicle.

Risk Stratification Tools : There are a number of risk stratification scores like the Canadian Syncope Risk Score (for patients >16 years)(Fig 5)¹⁴, the FAINT Score for patients >65 years¹⁵, the San Francisco Rule¹⁶ and the OESIL Score¹⁷. All give validated relative risk and guidance for TLOC and can guide the safety of discharge from the General Practitioners Clinic or Emergency Department.

The National Institute for Health and Care Excellence (NICE) Guidelines¹³ recommend that patients with TLoC who present in the Emergency

Category	Points
Clinical evaluation	
Predisposition to vasovagal symptoms*	-1
History of heart disease†	1
Any systolic pressure reading < 90 or > 180 mm Hg‡	2
Investigations	
Elevated troponin level (> 99th percentile of normal population)	2
Abnormal QRS axis (< -30° or > 100°)	1
QRS duration > 130 ms	1
Corrected QT interval > 480 ms	2
Diagnosis in emergency department	
Vasovagal syncope	-2
Cardiac syncope	2
Total score (-3 to 11)	—

Total score	Estimated risk of serious adverse event, %	Risk category
-3	0.4	Very Low
-2	0.7	Very Low
-1	1.2	Low
0	1.9	Low
1	3.1	Medium
2	5.1	Medium
3	8.1	Medium
4	12.9	High
5	19.7	High
6	28.9	Very High
7	40.3	Very High
8	52.8	Very High
9	65.0	Very High
10	75.5	Very High
11	83.6	Very High

Fig 5 — Canadian Syncope Risk Score¹⁴

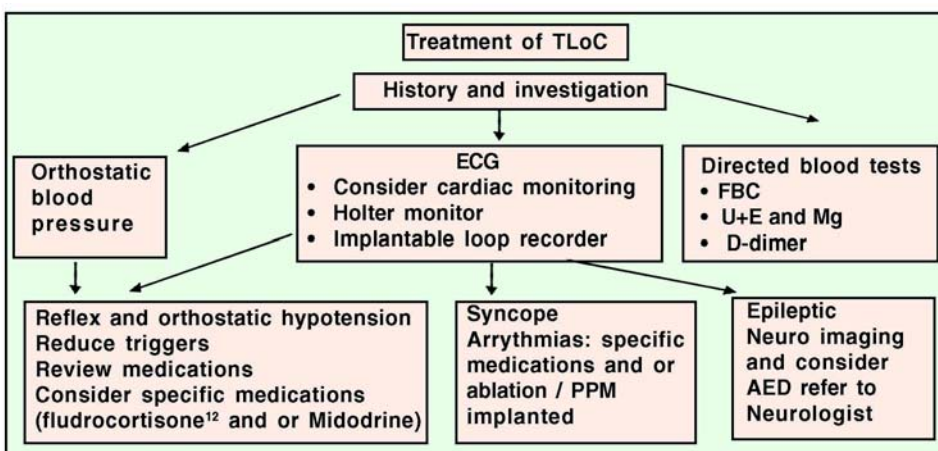


Fig 4 — Flowchart of the management of TLoC (FBC – Full Blood Count, U+E – Urea and Electrolytes Mg – Magnesium and AED- Anti Epileptic Drugs)

Department will need referral for further investigations if they have any one of the following:

- An abnormal ECG
- TLOC during exercise
- Family history of sudden death (in a person <40 years old or an inherited cardiac condition)
- New or unexplained breathlessness
- Heart murmur

CONCLUSION

TLoC is a common presentation in both hospitals and in general practice and is a low-risk condition in most cases though high stakes in some patients that may result in death. It is vital that the physicians are able to risk stratify and differentiate the serious causes of TLoC from the non-serious causes and start appropriate investigations as early as possible to reduce both mortality and morbidity that comes with it but also avoid unnecessary investigations. Use of risk stratification tools like the different risk calculators can be valuable aid on top of the clinical judgement in this regard. It is also vital that patients presenting with TLoC are given appropriate advice on driving to protect the patient and the public from harm.

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