

'Collapse ? Cause' - Avoiding Misdiagnosis in Falls

Introduction

'Collapse ? cause', 'fall', 'syncope', 'blackout', 'drop attack' and '? fit' are terms all commonly used by healthcare staff and patients to describe events leading to emergency presentations. Clinicians and patients often lack accurate understanding of these terms and their implications; they may be used synonymously or mean different things to different people. 'Collapse' implies either transient loss of consciousness (TLOC) or a fall without loss of consciousness.

- TLOC is usually caused by syncope, seizure or a psychogenic event. Syncope is an abrupt and transient loss of consciousness resulting from sudden impairment of cerebral perfusion, but the term is frequently misused to include falls without loss of consciousness. 'Faint' and 'blackout' are looser terms, often used interchangeably for syncope.
- Falls without loss of consciousness are subdivided into collapses and 'mechanical falls', e.g. from impaired mobility or during a sporting activity. Both are commonly mislabelled as 'syncope' despite retained consciousness.

The cause of collapse must be accurately identified for both clinical and socio-economic reasons. In practice, such judgements often rest with the most junior medical and nursing staff. Misdiagnosis is common, usually through incomplete history taking and examination, or failure to recognise vital clues, e.g. ECG abnormalities, or through making premature diagnoses (mostly of epilepsy).

Scale of the problem

In 2005/6, there were 82,999 admissions in England with 'syncope and collapse' (302,969 bed days), with mean patient age of 67 years¹; these figures will only rise further with an ageing population. Fractures provide an even more striking example of the socioeconomic cost of falls: in Wales alone 4,200 hip fractures occur annually, costing £84 million, with 7% of such patients dying in the first month and 25% within one year.² Clearly, secondary prevention is essential for patients who have fallen. Probably the most costly misdiagnosis is the incorrect labelling of patients with epilepsy,³ estimated at costing the NHS £138

million per annum,⁴ not to mention the far-reaching consequences for individual patients.

Clinical Assessment

Emergency

Any patient who has fallen requires detailed assessment but the priority, as with any emergency presentation, is airway, breathing and circulation (ABC). Any patient who is short of breath, has chest pain, acute headache or significantly abnormal vital signs, clearly needs urgent assessment and treatment. Pulmonary embolism, myocardial infarction and subarachnoid haemorrhage (amongst others) are diagnoses not to miss.

History

If the patient is stable, the most important step is to obtain a reliable history of the event and of any prior falls. This may not be possible if the patient is confused, drowsy or amnesic, e.g. from a head injury, and witness accounts should be sought. Unfortunately, in busy emergency settings the most crucial components are often overlooked, leading to misdiagnosis. Particularly important is the



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Box 1: Important history pointers in the falls patient

- Did the patient lose consciousness or not?
- If so, for how long? Was the recovery immediate, fast, or delayed?
- Were there precipitating environmental or physiological triggers (e.g. prolonged standing, hot environment, micturition, fear)?
- Were there warning symptoms (e.g. aura or pre-syncope)?
- Is there any witness description?
- Did anything suggest a mechanical aetiology (tripping, trauma, weakness)?
- Was there inter-current illness (e.g. sepsis, diabetic ketoacidosis, hypoglycaemia, Addison's disease, haemorrhage)?
- Were there neurological disturbances affecting balance, gait, or movement (e.g. vertigo, ataxia, parkinsonism, visual impairment)?

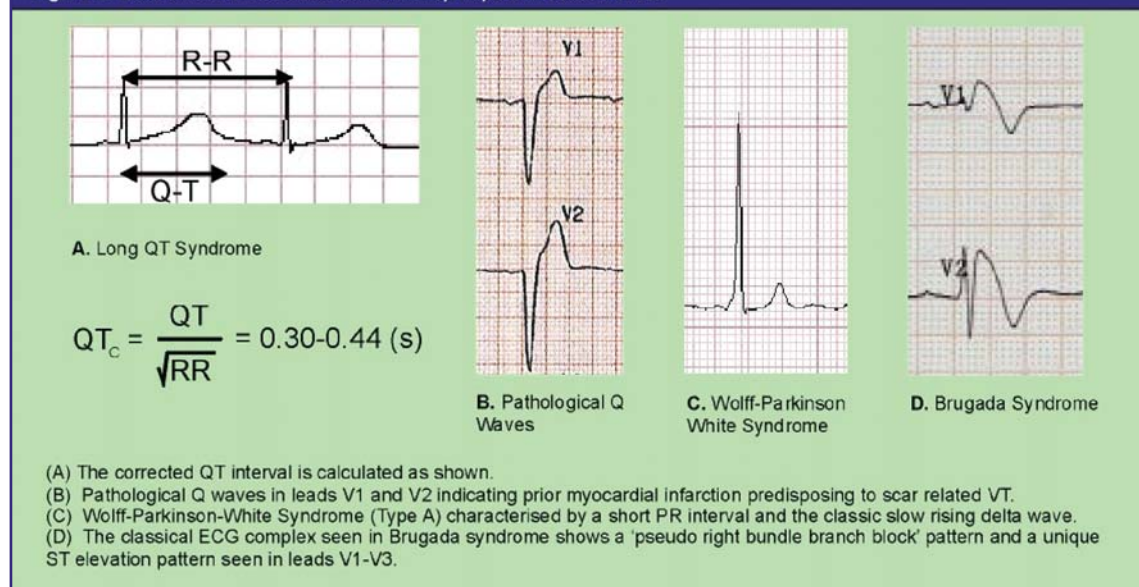
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Resources

- www.stars.org.uk has a Blackouts Checklist endorsed by DoH for free download.

Figure 1. ECG abnormalities associated with syncope and sudden death.



search for evidence of structural heart disease or arrhythmia. This is especially true where the history includes syncope during exercise or whilst lying down, syncope with palpitations, a family history of sudden death or a history of heart disease (especially previous myocardial infarction). These patients require prompt cardiology assessment. Clinicians should resist the temptation to make a premature diagnosis, when repeated history taking, the passage of time, and future witness accounts might clarify the situation. The most salient history points are summarised in Box 1.

Having documented the fall, the clinician should seek associated factors; careful inspection of the patient's medication is crucial to this. Neuroleptics, antidepressants, sedatives, diuretics and antihypertensive medication consistently increase the risk of falls, mainly through sedation, imbalance and postural hypotension. Certain medications may prolong the QT interval,⁵ so promoting cardiac syncope. Those (especially older) persons taking four or more medications are at greatest risk of falling; reducing their number of medications reduces their fall frequency.⁶ Information about the patient's home and surroundings, in particular stairs, carpets, etc. is also important; these may contribute to falls in those with impaired mobility and represent modifiable risk factors that, if missed, can exacerbate misdiagnosis.

Examination

The patient who has fallen requires a thorough examination, particularly for evidence of injury, and cardiovascular or neurological abnormalities.

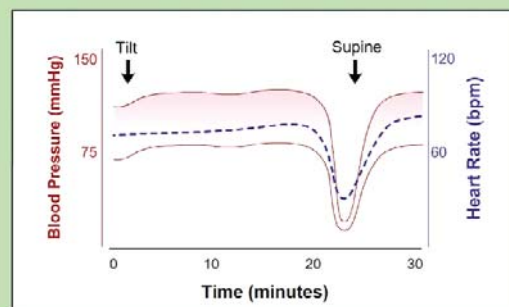
- Evidence of injury will include head trauma and fractures, particularly in the elderly.
- Cardiovascular examination. A crucial part of the falls assessment is to measure the lying and standing blood pressure (BP). This is primarily to detect orthostatic hypotension, particularly in elderly patients. Orthostatic hypotension is a fall in systolic BP of at least 20mmHg within three minutes of standing.⁷ This usually reflects autonomic failure due to systemic disease such as diabetes mellitus or alcohol toxicity, but may occur (with orthostatic pre-syncope) as an isolated finding in the elderly. Commonly it is caused or worsened by inter-current illness (dehydration, Addison's disease, etc.) or drugs (see above). Although often performed and recorded, it is rarely done adequately. Most patients first undergo BP measurement lying down and then a single measurement immediately after standing, usually without heart rate measurement. This may identify some patients with orthostatic hypotension and may usefully correlate with the patient's presenting symptoms but a negative result would not exclude orthostatic hypotension. The patient should remain standing for at least three minutes, with repeated BP measurements if there is no drop, in order to increase its sensitivity. The heart rate should also be measured, as this fails to change in autonomic failure despite the BP fall (Figure 2).
- Neurological examination can reveal much about the cause of falls yet this part of the assessment is often done poorly. Patients (especially the elderly) are rarely asked to walk in emergency settings despite the recommendation to perform the 'get up and go' test.⁸ Asking the patient to rise from a chair without using the arms, walk a few steps and then return, identifies those who need further assessment and intervention. This is especially true since dyspraxia may not be revealed by bedside examination. A full neurological examination should reveal gait abnormalities, visual loss, extra-pyramidal signs, ataxia and weakness that might contribute to falls. In reality however, the examination will be normal in most falls patients, especially those with syncope.

Investigations

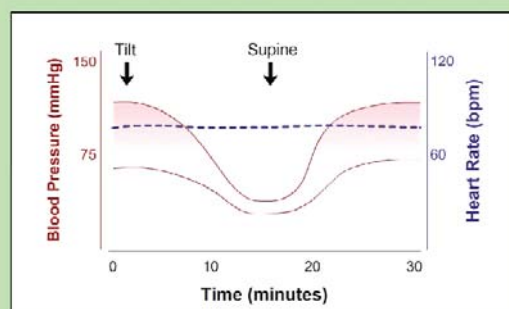
Electrocardiogram (ECG). An ECG is mandatory for all patients with unexplained falls. Clinicians dealing with patients who have fallen should recognise and actively seek certain specific ECG abnormalities.⁸ These may be rhythm or conduction abnormalities but the most important are those signalling susceptibility to sudden cardiac death, namely long QT syndrome, pathological Q-waves (indicating susceptibility to scar-related ventricular tachycardia), Wolff-Parkinson-White syndrome and Brugada syndrome (Figure 1).

Head-up tilt-table testing is a useful investigation in recurrent unexplained syncope, having the advantage of a controlled environment, providing accurate physiological data, and allowing correlation of the patient's symptoms with their physiological signs. Its primary role is to identify those patients with a propensity to vasovagal syncope and those

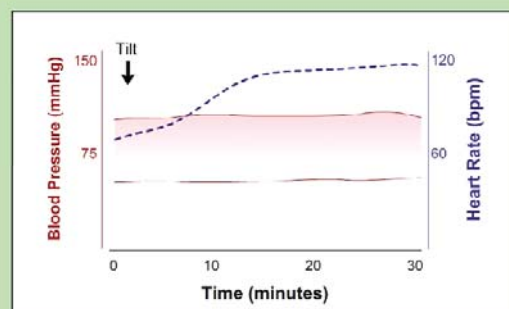
Figure 2. Examples of abnormal physiological responses in Head-Up Tilt-Table Testing



A. Vasovagal Syncope - There is an abrupt fall in heart rate and blood pressure occurring after a significant period of 60 degree upright tilt.



B. Orthostatic Hypotension - The blood pressure slowly begins to fall soon after tilting but there is failure of the normal compensatory increase in heart rate.



C. Postural Orthostatic Tachycardia Syndrome (POTS) - Defined as an orthostatic intolerance associated with an increase in heart rate of more than 30bpm or to greater than 120bpm within 10 minutes of standing.

with suspected delayed orthostatic hypotension. Orthostatic hypotension symptoms and signs may be delayed for 10 or more minutes,⁹ posing a diagnostic challenge and contributing to misdiagnosis. Where the suspicion of orthostatic hypotension remains high despite negative bedside testing, or there are repeated high-risk falls, the patient should be considered for head-up tilt-table testing. Examples of the typical responses in vasovagal syncope, orthostatic syncope and postural orthostatic tachycardia syndrome are shown in Figure 2.¹⁰

Common pitfalls

Transient ischaemic attack (TIA). A major misconception is that loss of consciousness might represent a TIA; in fact it virtually excludes it. This misdiagnosis is commonplace in elderly patients or those with vascular risk factors and leads to unnecessary investigations such as carotid Doppler studies and even angiography. As the clinician has already identified these patients as high risk, the investigation often finds significant and treatable disease, but its management does not help the patient's falls. As in epilepsy clinics, specialist TIA clinics receive many referrals of patients who have suffered syncopal episodes.

Epilepsy. Many patients with falls from vasovagal or cardiogenic syncope are misdiagnosed as epilepsy: the literature suggests around 20%.¹¹ This creates serious problems: patients may be prescribed potentially danger-

ous long-term medication, be subject to driving and lifestyle restrictions and even social stigma, and all the while their actual diagnosis remains untreated. The error is particularly likely when syncope is convulsive. Brief myoclonic jerks or reflex anoxic seizures are poorly recognised as normal consequences of impaired cerebral perfusion. This might then be compounded by over-interpretation of minor electroencephalogram (EEG) abnormalities.

Psychogenic non-epileptic seizures (pseudo-seizures) are commonly misdiagnosed as epileptic seizures, and less commonly vice versa. As many as 50% of patients with apparent status epilepticus have pseudoseizures or 'pseudostatus'¹² and are often intubated and managed on intensive care units. This may arise

from an over emphasis on features such as incontinence, tongue biting, and unresponsiveness being suggestive of epileptic seizures, or may reflect under-recognition by medical staff of the prevalence of pseudoseizures, which are not well covered in undergraduate teaching. Indeed, this may be felt to be the case for functional disease in general.

Avoiding misdiagnosis

Misdiagnosis of patients who have fallen is common and often has significant consequences. Much of this can be avoided by a systematic approach to the history and examination and by awareness and understanding of the differential diagnosis of falls and the pathophysiology involved, e.g. in convulsive syncope. The crucial but often overlooked aspects of

assessment include a detailed medication review, examining the patient's gait and looking carefully for orthostatic hypotension when the clinical suspicion is high. Early involvement of allied healthcare professions such as physiotherapy and occupational therapy, as well dedicated 'falls' teams in some hospitals, aim to identify individual factors contributing to falls and to limit future risk. The best way to avoid misdiagnosis is to retake the history, from different sources and at different times, and to resist premature diagnoses. This is especially useful in suspected epilepsy where increasingly patients are directed to specialist services in an attempt to limit misdiagnosis. Useful care pathways have been suggested to provide a framework for managing these patients in different environments.³

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