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Pitfalls in managing falls

Falls are common in the elderly and one of the most common reasons for older people to seek medical help. To illustrate the diagnostic dilemmas of this common clinical problem, we present a case study of a woman with a history of recurrent falls.

Case study

Mrs OL, aged 75 years, was admitted for pain control and mobility assessment following an unwitnessed fall that resulted in soft tissue injury to her back. Although initially assessed to be due to mechanical reasons, detailed questioning revealed that the cause of the fall was unexplained. She had had six fall related admissions over a period of 18 months at three different hospitals. Only one of the falls was witnessed, and the diagnosis at each admission was variably recorded as:

- simple or accidental fall
- unexplained fall
- investigated for falls/syncope, and
- epilepsy.

Mrs OL had been taking phenytoin 200 mg/day for 2 months, after her son, who witnessed the last episode, reported some seizure activity. Mrs OL's description of the history of falls was vague, but she denied any prodrome, postural symptoms or loss of consciousness. She was fearful of falling and had developed symptoms of depression; she felt her mobility and independence had been compromised. Her only other significant medical history was hypertension. Her other medications included ramipril 5 mg/day, sertraline 50 mg/day, and calcium and vitamin D supplements. Physical examination was unremarkable. Her cognition was normal. Blood pressure was 140/84 and there was no postural hypotension detected. Numerous previous investigations, including Holter monitoring, echocardiogram, Doppler studies of the carotid and vertebral arteries, computerised tomography and magnetic resonance imaging/angiography of the brain and electroencephalogram were nondiagnostic.

During the current admission she had a head up tilt table test. Fifteen minutes of drug free tilting at 70 degrees provoked symptomatic bradycardia with sinus pauses of >3 seconds (*Figure 1*), confirming the diagnosis of cardioinhibitory vasovagal syncope, a type of neurally mediated syncope. Mrs OL had transient loss of consciousness associated with epileptiform movements. Her symptoms resolved within 15–30 seconds of resuming the supine position. A dual chamber pacemaker was inserted and she remained asymptomatic on follow up at 11 months. She no longer suffered from depression and had renewed confidence.

Falls and syncope are important causes of morbidity in the elderly and among the leading causes for older people to attend hospitals.[1] Epidemiological studies have reported falls in approximately one-third of those aged over 65 years.[2] Syncope has been shown to have a 10 year prevalence of 23% and a yearly incidence of 6–7% in the elderly.[3] Although accidental falls may be common in community practice, the prevalence of unexplained falls appear high among older patients presenting to hospitals for fall related complaints.[4,5]

As illustrated in the case study, the boundary between falls and syncope is poorly delineated in the elderly. Cardiovascular causes, particularly neurally mediated syncope (NMS) have increasingly been recognised as causes of previously unexplained falls, as well as related conditions such as dizziness, epilepsy and drop attacks.[6,7] As in the case of Mrs OL, misdiagnosis of epilepsy has also been recognised.[8,9]

An accurate history, which is crucial for the diagnosis of these conditions, is often unavailable or unreliable in the elderly,[5,10] and there is a growing body of evidence that suggests an overlap of symptoms between falls and syncope. The proposed explanations for this overlap are the retrograde amnesia for the syncopal episode, and the loss of balance due to modest haemodynamic changes that are insufficient to cause loss of consciousness but sufficient enough to cause falls in older patients with underlying gait and balance instabilities.[6,11]

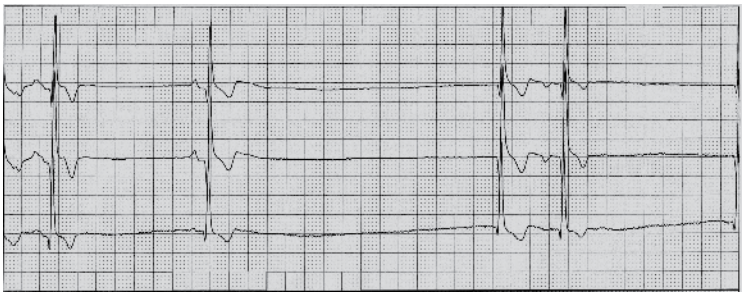
Neurally mediated syncopal syndromes

The different NMS syndromes are shown in *Table 1*.[12] Of these, vasovagal syncope (VVS) and carotid sinus syndrome (CSS) are diagnostically challenging in clinical practice and often require specific investigations such as the head up tilt table test (HUTT) or carotid sinus massage (CSM) for confirmation of diagnosis.

Vasovagal syncope

The precise mechanisms responsible for VVS are not fully elucidated. Inhibitory reflexes from the heart are thought to play a significant role. There is evidence for the involvement of both neural and chemical pathways, and both Bezold-Jarisch and carotid sinus reflexes may be involved.[13] HUTT simulates many aspects of the pathophysiology of VVS and has been validated to be a useful diagnostic test. The current

Figure 1. ECG demonstrating prolonged sinus pauses



indications and recommendations for HUTT are shown in *Table 2*.[14] Based on studies in control subjects, HUTT has been shown to have a high diagnostic specificity (92% without pharmacologic stimulation and 88% with stimulation).[14,15] Precise estimation of sensitivity is difficult in the absence of a gold standard for comparison. The apparent sensitivity varies between 32–85% depending on the test protocol and patient selection.[14]

The common faint is the prototype of VVS. In most patients, the manifestation of VVS has the distinct features of:

- prodrome or aura of variable duration
- transient loss of consciousness, and
- postsyncopal phase.[16]

The postsyncopal phase is often brief and followed by rapid recovery, which assists in differentiating syncope from seizures and ischaemic cerebral events.[17] However, these distinct features may not be present in the elderly and, not infrequently, the elderly patient may present with only recurrent unexplained syncope or falls, as was the case with Mrs OL.[5]

Incorporation of HUTT and CSM in the diagnostic algorithm for syncope and related conditions has been shown to increase the diagnostic yield considerably.[18] However, a specific diagnosis may be elusive in a small but significant number of patients, even after extensive investigations, and extended cardiac monitoring using an implantable loop recorder and/or electrophysiologic studies may be helpful.[18]

Management

The management of VVS consists of educating patients on commonsense approaches to prevent syncope or fall, review of culprit medications, pharmacological treatment, and cardiac pacing in selected cases of cardioinhibitory VVS. The utility of cardiac pacing has not yet been clearly established in double blind, randomised controlled trials and, at present, there is a paucity of evidence in the literature to inform practitioners regarding the selection of patients for cardiac pacing.[19–21] However, as this case illustrates, selected patients with recurrent symptoms who demonstrate a significant cardioinhibitory response during HUTT may benefit from cardiac pacing. Although the long term prognosis for VVS is relatively benign when compared with other cardiac causes of syncope, the deleterious physical and psychological effects of recurrent falls and syncope on individual patients should not be underestimated.

Table 1. Neurally mediated syncopal syndromes

- Vasovagal syncope
- Carotid sinus syndrome
- Situational syncope
  - cough
  - micturition
  - gastrointestinal stimulation
  - postexercise/exertion
- Glossopharyngeal/trigeminal neuralgia

Table 2. Indications for HUTT

Class I (evidence and/or general agreement that HUTT is useful)

- Unexplained single syncopal episode in high risk settings or recurrent episodes in the absence of organic heart disease, or, in the presence of organic heart disease, after cardiac causes of syncope have been excluded
- Clinical value for the patient to demonstrate susceptibility to neurally mediated syncope

Class II (conflicting evidence and/or divergence of opinion regarding utility of HUTT)

- Evaluating patients (especially elderly) with recurrent unexplained falls
- Differentiating patients with syncope with jerking movements from epilepsy
- Assessing recurrent presyncope or dizziness
- Assessment of postural orthostatic tachycardia syndrome, orthostatic hypotension, psychogenic and hyperventilation syncope
- Assessment of carotid sinus hypersensitivity

Class III (evidence and/or general agreement that HUTT is not useful)

- Assessment of treatment
- Single episode of syncope without injury and not in a high risk setting
- Clear cut clinical vasovagal features leading to a diagnosis when demonstration of a neurally mediated susceptibility would not alter treatment

Conclusion

This case study reinforces the evidence for overlap of symptoms between falls and syncope in the elderly and illustrates the diagnostic dilemmas of this common clinical problem. As seen in the case of Mrs OL, in clinical practice, NMS is often under recognised and under diagnosed, frequently leading to many unnecessary investigations and treatments.[9] A high index of clinical suspicion and a timely considered HUTT and/or CSM are diagnostically prudent in older patients with unexplained recurrent syncope or falls.

Summary of important points

- Recurrent unexplained falls/syncope is a common and serious diagnostic problem in the elderly.
- NMS is a common cause of syncope.
- Current evidence supports an overlap of symptoms between unexplained falls and syncope, particularly NMS.
- Timely consideration of HUTT/CSM is diagnostically prudent in the investigation of unexplained falls, syncope and other related syndromes such as atypical seizures.
- A holistic management approach is required for elderly patients with recurrent unexplained falls or syncope.

Conflict of interest: none declared.

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