

Being Conscious of Syncope

What are the differential diagnoses of syncope? How should patients be managed?

Gary Klein, MB, BS, FRCPC

As presented at the University of Calgary's Family Practice Update (November 2003)

Syncope is a common condition, with a reported prevalence rate between 3% and 30% of the general population;^{1,2} the discrepancy between these figures probably represents differences in definitions and case ascertainment. The prevalence of syncope increases with age. Up to half of all cases are unexplained, even after appropriate investigation. Syncope accounts for 3% of emergency department (ED) visits and 6% of hospital admissions.³ Although syncope is often dismissed as a "benign" diagnosis, it is important to remember that syncope is a symptom rather than a diagnosis. Mortality rates from undiagnosed cardiac disease can be extremely high in the elderly population.

Seizure vs. syncope

In general, the problem is not one of over-diagnosis of syncope, it is the misdiagnosis of syncope as seizure.⁴ Up to 20% of seizure patients actually have seizure-like or convulsive syncope.⁴ Manifestations include:

- generalized or multifocal jerking,
- odd eye movements,
- odd vocalizations, and
- tonic spasms.

Such manifestations can occur in 12% of blood donors, 75% of patients undergoing tilt-table test-

Ms. Cohen's Blackout

Ms. Cohen, 33, had a disagreement with a salesclerk in a home improvement store. About five minutes later, she felt unwell, and then she blacked out. She was seen and assessed in the emergency department, and was eventually referred to the neurology unit as a seizure case.



For more on Ms. Cohen, see page 39.

ing, and up to 90% of healthy individuals undergoing other provocative tests for syncope.⁴

A misdiagnosis of syncope as seizure carries many obvious negative connotations. For instance, the loss of a driver's licence can be very disruptive and may even result in job loss and unemployability. Anticonvulsants have side-effects and may worsen syncope. Missing a cardiac diagnosis can have disastrous consequences.

A good history will usually distinguish between seizure and syncope. Seizures are usually longer, unprovoked, seldom heralded by any kind of warning, and usually followed by some kind of post-ictal state. It is important to remember that electroen-

Mrs. Leonard's Case

Mrs. Leonard, 63, presented to internal medicine with a six-month history of syncope and presyncope. She had a long history of pre-existing hypertension and hypercholesterolemia. Initial investigations, including an echocardiogram, electrocardiogram, and 24-hour Holter monitor were normal.



For a followup on Mrs. Leonard, see page 39.

cephalograms (EEGs) are only diagnostic in half of those with established epilepsy, and imaging with computed tomography (CT) or magnetic resonance has a much lower yield.

Arrhythmia vs. syncope

The real danger of syncope is the underdiagnosis of life-threatening cardiac disease. In a recent study, 987 patients with syncope of unknown origin were investigated.⁵ Even after extensive testing, 19.8% were not offered a specific diagnosis, and 18.4% had more than one potential cause of syncope.⁵ The most common cause of syncope was neurally mediated syncope in a group of patients with a mean age of 58, but 37.4% of patients had a significant cardiac diagnosis.⁵ After four years, 26.9% of individuals with multiple

About the author ...

Dr. Klein is a clinical associate professor at the University of Calgary, staff neurologist, Calgary Regional Health Authority, and site co-ordinator in neurology, Rockyview General Hospital, Calgary, Alberta.

Frequently Asked Questions

1. When should syncope be diagnosed?

Never. Syncope is a symptom, not a diagnosis.

2. How common is syncope?

The prevalence of syncope is as high as 30%, depending on the definition used and the population studied.

3. Is syncope a benign symptom?

The mortality of syncope can be as high as 27% in some populations. It is highest in older patients with multiple causes of syncope. The risk of sudden cardiac death cannot be ignored in those with vascular risk factors.

4. What are the most important tests for a patient with syncope?

Cardiac assessment must always take priority over everything else.

5. What is the best treatment for a patient with vasovagal syncope?

Changes in lifestyle and increased salt intake remain the best therapies for syncope.

causes of syncope had died.⁵ This population clearly included many elderly individuals with vascular disease risk factors, but, prior to appropriate cardiac evaluation, a diagnosis of serious cardiac disease was not obvious.

Stroke vs. syncope

The real incidence of cerebrovascular disease in those with isolated syncope is extremely low, despite the fact that syncope, presyncope, and dizziness are common reasons for referral to stroke clinics. In general, the diagnosis of

stroke need not be high on the differential diagnosis unless accompanying symptoms point in this direction. Obviously, those at risk for cardiac disease are equally at risk for stroke.

What is neurally mediated syncope?

Neurally mediated syncope is an acute cardiovascular reaction to a sudden change in autonomic nervous system function. The usual “standing” pattern of increased sympathetic tone and reduced parasympathetic tone is reversed, resulting in bradycardia and peripheral vasodilatation. It can be provoked by emotional factors, peripheral stimuli (such as pain, cough, bladder emptying or bowel distension), reduced blood volume, or venous pooling from any cause. These factors create symptoms when they result in bradycardia or postural hypotension, or a mixture of both.

Investigation

In general, it is far safer to over-investigate than to miss a potentially lethal, but treatable disease.

Cardiac testing may include electrocardiography (ECG), Holter monitoring, electrophysiologic testing, and closed-loop recording. A cardiology referral should be considered mandatory for individuals with:

- a cardiac history or symptoms,
- a family history of sudden unexplained death,
- multiple risk factors for vascular disease, and
 - a new onset of syncope, especially in older patients.

The yield of cranial CT and EEG is low even in those with known epilepsy. If the clinical suspicion of epilepsy based on historical features is low, then there is seldom much to gain from either test. This having been said, both tests are safe, relatively inexpensive, and usually easy to obtain. By the same token, the yield of testing for cerebrovascular disease is only respectable in those with a strong clinical suspicion of transient ischemic attacks. The morbidity and cost generated by a single large stroke make it very easy to justify the expense of many stroke workups.

Tilt-table testing remains the gold standard for those with neurally mediated syncope. It is

A followup on Ms. Cohen

At the time of this episode, Ms. Cohen was six weeks postpartum. She was taking domperidone, 20 mg four times daily, because of problems with lactation. This drug is very rarely associated with irritability and seizures, but the episode was felt to be vasovagal syncope caused by stress and fatigue. The domperidone was stopped and the patient has been well ever since.

Mrs. Leonard's diagnosis

After all other investigations were negative, Mrs. Leonard was referred for an electroencephalogram (EEG). Entirely as expected, the EEG was normal. However, an electrocardiogram rhythm strip recorded as a routine procedure during the EEG caught an episode of profound bradycardia. The final diagnosis after cardiac electrophysiologic testing was sick sinus syndrome requiring a pacemaker.

the only way to establish a firm diagnosis. It should be performed in those with recurrent syncope and no other diagnoses.

What are the treatment options?

Lifestyle changes and volume expansion remain the best options for those with recurrent neurally mediated syncope.

One option for lifestyle change is orthostatic training. This type of training usually consists of having patients habituate themselves to prolonged periods of standing, and having them practise isometric leg exercises, which are designed to increase venous return to the heart. This training has limited effectiveness, however, because many recurrent fainters are young and healthy individuals.

The major risk of volume expansion with salt or mineralocorticoids is hypertension. Again, because many patients are young and healthy, the real risk of sustained hypertension is small, therefore, these methods can be useful.

Beta blockers were used for those with syncope because of the theory that syncope was preceded by an adrenaline surge that resulted in secondary reflex bradycardia. After five controlled trials and many uncontrolled trials and reports, beta blockers have been shown to be ineffective.⁶

Alpha agonists cause peripheral vasoconstriction and work best in those with established postural hypotension.

No other medications are proven to work. Cardiac pacing may be considered in extreme situations of recurrent intractable syncope, but, clearly, would only be a treatment of last resort. Logically, cardiac pacing should work best in

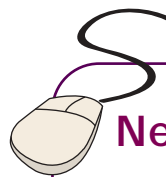
Take-home message

- Syncope is a symptom, not a diagnosis.
- Syncope occurs in 3-10% of the general population, and accounts for 3% of ED visits and 6% of hospital admissions.
- In general, it is safer to over-investigate than to under-investigate and miss a potentially lethal, but treatable, disease.
- Tilt-table testing is the gold standard for individuals with neurally mediated syncope.
- The best treatment options for neurally mediated syncope are lifestyle changes (including orthostatic training) and volume expansion.

those where bradycardia, rather than postural hypotension, is prominent. 

References

1. Savage DD, Corwin L, McGee DL, et al: Epidemiologic features of isolated syncope: The Framingham Study. *Stroke* 1985; 16(4):626-9.
2. Krahn AD, Klein GJ, Skanes AC, et al: Use of the implantable loop recorder in evaluation of patients with unexplained syncope. *J Cardiovasc Electrophysiol* 2003; 14(9 Suppl):S70-3.
3. Kaufman H, Bhattacharya K. Diagnosis and treatment of neurally mediated syncope. *Neurologist* 2002; 8(3):175-85.
4. Bergfeldt L: Differential diagnosis of cardiogenic syncope and seizure disorders. *Heart* 2003; 89(3):353-8.
5. Chen LY, Gersh BJ, Hodge DO, et al: Prevalence and clinical outcomes of patients with multiple potential causes of syncope. *Mayo Clin Proc* 2003; 78(4):414-20.
6. Brignole M: Randomized clinical trials of neurally mediated syncope. *J Cardiovasc Electrophysiol* 2003; 14(9 Suppl):S64-9.



Net Readings

1. 2001 European Society of Cardiology Guidelines on Management of Syncope
www.escardio.org/scinfo/Guidelines/management_syncope.pdf
2. What You Need to Know About Syncope
www.heartdisease.about.com/cs/syncope