Evaluation of Syncope: The Diagnostic Puzzle

Michael Braun, DO, FAAFP, RFPHM

ACTIVITY DISCLAIMER

The material presented here is being made available by the American Academy of Family Physicians for educational purposes only. Please note that medical information is constantly changing; the information contained in this activity was accurate at the time of publication. This material is not intended to represent the only, nor necessarily best, methods or procedures appropriate for the medical situations discussed. Rather, it is intended to present an approach, view, statement, or opinion of the faculty, which may be helpful to others who face similar situations.

The AAFP disclaims any and all liability for injury or other damages resulting to any individual using this material and for all claims that might arise out of the use of the techniques demonstrated therein by such individuals, whether these claims shall be asserted by a physician or any other person. Physicians may care to check specific details such as drug doses and contraindications, etc., in standard sources prior to clinical application. This material might contain recommendations/guidelines developed by other organizations. Please note that although these guidelines might be included, this does not necessarily imply the endorsement by the AAFP.

This CME session is supported by an educational grant to the AAFP from Lundbeck.

DISCLOSURE

It is the policy of the AAFP that all individuals in a position to control content disclose any relationships with commercial interests upon nomination/invitation of participation. Disclosure documents are reviewed for potential conflicts of interest (COI), and if identified, conflicts are resolved prior to confirmation of participation. Only those participants who had no conflict of interest or who agreed to an identified/resolution process prior to their participation were involved in this CME activity.

All individuals in a position to control content for this session have indicated they have no relevant financial relationships to disclose.

The content of my material/presentation in this CME activity will not include discussion of unapproved or investigational uses of products or devices.

Michael Braun, DO, FAAFP, RFPHM

Chief, Inpatient Medicine, Department of Family Medicine, Madigan Army Medical Center (MAMC), Tacoma, Washington; Director of the Medical Wards, MAMC, Tacoma, Washington

Dr. Braun earned his medical degree at the Philadelphia College of Osteopathic Medicine, Pennsylvania, and completed his residency in family medicine at Womack Army Medical Center, Fort Bragg, North Carolina. At MAMC, he has been on faculty for seven years and a practicing hospitalist for five years. He has earned Recognition of Focused Practice in Hospital Medicine (ABFM) and the American Board of Internal Medicine (ABIM).

Learning Objectives

1. Evaluate patients who present with syncope to determine cardiac or non-cardiac causes.
2. Prepare diagnostic plans for patients who present with neurocardiogenic forms of syncope, which may include conducting a differential diagnosis of syncope.
3. Utilize evidence based clinical decision tools and algorithms to determine non-hospital vs. hospital management of patients with syncopal episodes.

Audience Engagement System

Step 1

Step 2

Step 3
Case 1
A 57yo male presents to ED after a fainting episode preceded by nausea. LOC with complete and immediate recovery. Witness denies jerking of extremities.

AES POLL QUESTION
Is this syncope?
A. Yes
B. No

Definition
• Transient loss of consciousness
• Rapid, brief, spontaneous recovery

Global Cerebral Hypoperfusion

Non-syncope
Non-syncope TLOC
• Seizures
• Traumatic(concussion)
• Metabolic(hypoglycemia)
• Psychogenic(pseudo-syncope)

Mimickers
• Cerebrovascular accident
• Intoxication
• Breath-holding spells
• Narcolepsy
• Hypoxia/Hypercapnia
• Vertigo
• Falls

Case 1 - continued
Prior case: 57yo male with PMHx of HTN and hyperlipidemia. Syncope occurred in hot, crowded setting. Prodrome of nausea and palpitations.

AES POLL QUESTION
Please classify this syncope event:
A. Cardiac
B. Non-cardiac
Classification

- Cardiac
- Non-Cardiac
  - Reflex (Neurally mediated)
  - Orthostatic hypotension
- Bradyarrhythmia
  - Sinus node dysfunction (sick sinus syndrome)
- AV conduction dysfunction (2nd/3rd)
- Implanted device malfunction
- Tachyarrhythmia
  - Supraventricular tachycardia
  - Ventricular

Classification

Cardiac
- Arrhythmia
- Structural
  - Hypertrophic Cardiomyopathy (HCM), Cardiac mass, pericardial tamponade
  - Aortic stenosis
  - Acute MI, anomalies of coronary arteries
- Other
  - PE, aortic dissection

Classification

Reflex (Neurally) Mediated
- Vasovagal
  - Common faint – noxious stimuli
- Situational
  - Cough, micturition, defecation, postprandial
  - Carotid sinus syncope
Classification

Orthostatic Hypotension
- Autonomic dysfunction
  - Primary
  - Secondary
- Drug-induced
- Volume depletion

AES POLL QUESTION

Which of the following test should be done on every patient with syncope?
A. ECG
B. Echocardiogram
C. Tilt table test
D. Head CT

Evaluation

History
- Preceding circumstance/symptom
- Prodrome
- During TLOC
- Postdrome
- Background (FMHx, PMHx, Meds)
Evaluation

- Physical exam
- ECG
- Labs – as indicated
- Imaging – as indicated

Choosing Wisely Campaign

<table>
<thead>
<tr>
<th>Society</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>American College of Emergency Physicians</td>
<td>Avoid CT of the head in asymptomatic adult patients in the emergency department with syncope, insignificant trauma and a normal neurological evaluation.</td>
</tr>
<tr>
<td>American Academy of Neurology</td>
<td>Don't perform imaging of the carotid arteries for simple syncope without other neurological symptoms.</td>
</tr>
<tr>
<td>American College of Physicians</td>
<td>In the evaluation of simple syncope and normal neurological examination, don't obtain brain imaging studies (CT or MRI).</td>
</tr>
</tbody>
</table>

Evaluation – follow-on

- Cardiac imaging
- Provocative tests
- ECG monitoring tests

TRANSIENT LOSS OF CONSCIOUSNESS – LIKELY SYNCOPE

- Initial investigations - all patients
  - Detailed history
  - Physical examination
  - ECG

  -Suspicion of other cause for TLOC?
  - Selected testing
    - Electrocardiogram
    - 24-hour Holter

  Uncertain diagnosis
  - Further testing depends on patient risk and frequency of symptoms

Certain diagnosis (i.e. reflex syncope)
- No further testing
Evaluation – follow-on

Cardiac Imaging
- Echocardiogram
- Cardiac MRI
- Cardiac CT and myocardial perfusion scan
- Cardiac catheterization

Evaluation – follow-on

Provocative tests
- Carotid sinus massage
- ATP test
- Tilt-table testing
- Exercise treadmill test
- Electrophysiology study

Evaluation – follow-on

Monitoring tests
- Inpatient telemetry (24-72hrs)
- Holter monitor (24-48hrs)
- External loop recorder (30 days)
- Implantable loop recorder (3 years)
Brugada Syndrome
- Channelopathy
- Syncope with rest, supine, or fever
- RBBB w/ ST elevation V1-3

Arrhythmia - Brugada Syndrome

Pre-excitation (WPW) Pattern
- Accessory pathway bypass AV node
- Syncope with exercise
- Shortened PR interval with delta wave

Arrhythmia - WPW

Hypertrophic Cardiomyopathy (HCM)
- Most common inherited cardiac disease 1:500
- LV wall thickened
- Syncope with exercise
- LVH with repolarization

Specific Arrhythmia
Specific Arrhythmia

Long QT Syndrome
- Channelopathy
- QT > 440ms in males,
  >460ms in females
- 3 subtypes

Arrhythmia – Long QT Syndrome

Arrhythmia – HCM

Case 2

A 67yo male w/ HTN and HLP presents with an episode of syncope without prodrome. Denies known history of CV disease or heart failure. He does report occasional SOB with activity. BMP normal. CBC shows H/H 10/29.

AES POLL QUESTION

Would you admit this patient for monitoring and further workup?
A. Yes
B. No

Why?

Evaluation – Risk Stratification

<table>
<thead>
<tr>
<th>Risk score</th>
<th>Risk factors</th>
<th>Accuracy (Sens/Spec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco Syncope Rule</td>
<td>SBP&lt;90, h/o SCB, ECG abnl, h/o CHF, Hct&lt;30</td>
<td>98% / 56%</td>
</tr>
<tr>
<td>ROSE score</td>
<td>BNP&gt;300, HR&lt;50, DRE w/ FOB+, Hgb&lt;9, ECG abnl, O2 sat&lt;94%</td>
<td>87% / 56%</td>
</tr>
<tr>
<td>OESIL score</td>
<td>Age&lt;50y, h/o CV, syncope w/o prodrome, ECG abnl</td>
<td>97% / 73%</td>
</tr>
<tr>
<td>Canadian Score</td>
<td>Predisposition of vasovagal symptoms, abnormal QRS axis, abnormal QRS duration, h/o heart disease, SBP&lt;90 or &gt;180, elevated tropy, corrected QT&gt;480ms, ED diagnosis of cardiac syncope</td>
<td>5% 97-99%</td>
</tr>
</tbody>
</table>
### Evaluation – Risk Stratification

**High risk:**
- History suggests arrhythmia
- Comorbid conditions
- Abnormal ECG
- Family history sudden death
- Older age

**Low risk:**
- Age younger than 50
- No history of CV disease
- Normal ECG
- History consistent with non-cardiac syncope
- Unremarkable CV exam

### Referral
- No further workup
- Referral – specialized testing
  - Cardiology/Electrophysiology
  - Neurology
  - Psychiatry

### Treatment
- Cardiac
  - Refer to cardiology
- Non-Cardiac
  - Lifestyle modifications
  - Avoid triggers
  - Counter pressure maneuvers

### Driving restrictions
- Varies by local, state, and national government
- Patients with untreated syncope should be restricted
- Likelihood of motor vehicle accident increases two-fourfold.

### Practice Recommendations
- Labs/imaging as clinically indicated – SOR C
- Presyncope = syncope workup – SOR C
- ECG in all patients – SOR C
- Admit high risk patients – SOR C
- Low risk patients, no further workup – SOR B

### Questions
References


References


Contact Information

Michael M. Braun, DO
Email: michael.m.braun.civ@mail.mil

Reference

References


References


References


References