

Evaluation of Syncope in the Athlete:

Seeing the Common & Looking for the Dangerous

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CCSU Sports Medicine Symposium
March 14, 2017



Disclosures / Conflicts:

- No financial interests in this material.
- No off-label discussion of medications.
- The opinions expressed in the slides are mine.
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Syncope

Definitions

- From the Greek meaning "to cut short" or to "interrupt"
- Abrupt and Transient loss of consciousness
- Abrupt and Transient loss of postural tone
- **Onset** is relatively rapid: no more than 10-20 second of promontory symptoms
- **Recovery** is reversible, usually rapid, and complete.
- Underlying mechanism is transient global cerebral hypo-perfusion.

- **Pre-syncope**: lightheadedness, dizziness, or weakness that *almost* results in the loss of consciousness.



Syncopal

How many seconds of cerebral hypo-perfusion will result in syncope in most normal adults?

- 3 seconds
- 6 seconds
- 8 seconds
- 10 seconds
- 12 seconds

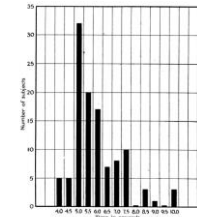


Fig. 1.—Distribution curve for time to faintness of the very fainting male normal of control distribution in 100 normal young men.

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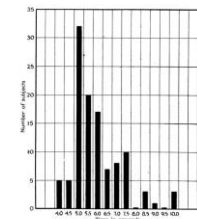


Fig. 1.—Distribution curve for time to faintness of the very fainting male normal of control distribution in 100 normal young men.

Syncopal: The Conundrum

Common

- Lifetime incidence is 40-50%
- 1% of all ED Visits
- 1-6% of all hospitalizations

Potentially Dangerous

- Syncopal can be a warning sign for Sudden Cardiac Arrest (SCA)
- SCA accounts for ~ 15% of all deaths in the US
- Examples: Reggie Lewis and Hank Gathers both had syncopal episodes prior to having SCA



Syncope

History: Timing

- What were they doing when they lost consciousness?
- **Unrelated to Exercise**
- **Exertional Syncope**
- **Post-Exertional Syncope**



Syncope

History: Unrelated to Exercise

- Most common, approx. 85%, usually vasovagal or orthostatic hypotension
- Often postural (sitting to standing or prolonged standing) and occurs in setting of dehydration.
- Triggers include emotional stress, severe pain especially visceral, as well as coughing, micturating, straining bowel movements.
- Characterized by feelings of warmth, nausea or "washed out"
- Symptoms can be *recurrent* and *prolonged*
- Prognosis is benign



Syncope

History: Post Exertional

- Occurs immediately after exercise, especially with no warm down
- Sudden decrease in venous return when leg muscles stop contracting, vasodilated state, acute increase in myocardial contractility resulting in activation of cardiac depressor reflex and paradoxical bradycardia.
- Dehydration can be a contributing factor.
- Generally benign and much less concerning than syncope with exercise.



Syncope

History: Exertional

- Least common, 1-2%
- Raises concern for structural heart disease
- Differential Diagnosis: Hypertrophic Cardiomyopathy (HCM), Dilated Cardiomyopathy (DCM), Channelopathies e.g. Long QT syndrome, Brugada Syndrome, myocarditis, anomalous coronary arteries., Wolff-Parkinson-White Syndrome (WPW)
- Commotio Cordis: sternal trauma resulting in sudden death
- Heat Stroke or Hyponatremia



Syncope

History: Other Factors

- Prodrome:
 - Assess for palpitations or chest pain.
 - Absence of any prior symptoms is suggestive of arrhythmia.
- Shaking: usually due to myoclonic jerking from hypoxia, seizure is rare.
- Bowel / Bladder Incontinence: Does not suggest seizure.
- History of Recurrence: > 4 yrs of episodes suggests benign prognosis.
- Family History: Assess for SCA, arrhythmias, cardiomyopathy



Syncope

History: Other Factors

- Postdrome:
 - "That was weird, but I feel fine now" is concerning for arrhythmia.
 - Prolonged fatigue, yawning, pallor, nausea, and being able to hear voices but having difficulty moving are reassuring signs
- Hyperthermia / Hyponatremia
 - Setting of prolonged exertion in hot weather
 - Persistent confusion and delirium
 - Core temp > 40C



Syncope

Physical Exam:

- General: fatigue vs. delirium
- Vital Signs:
 - Orthostatic Blood Pressure
 - Ongoing symptoms with normal vitals seen in VVS/OH
 - Core Temp >40C suggests heat stroke
- Skin: pallor, diaphoresis
- Cardiac: murmurs, enlargement of PMI
- Carotid Sinus Massage (most useful > 35 yrs old)



Syncope

Testing:

- Who to remove from activity and refer for further testing:
 - Any syncope with exertion.
 - Non-exertional or post-exertional syncope without typical features.



Syncope

Testing: Second Tier

- ECG: Long QT syndrome, Brugada Syndrome, WPW, HCM
- Echocardiogram: HCM, ARVC, DCM, valvular disease
- Exercise Stress Testing: Ventricular Tachycardia, SVT
- Long-Term Telemetry: correlates symptoms with ECG



Syncope

Testing: Third Tier

- Cardiac MRI: myocarditis, infiltrative processes
- CT Angiogram: non-invasive assessment for anomalous CA
- Coronary Angiogram
- EP Study: limited utility unless associated palpitations, abnormal ECG i.e. WPW, or structural heart disease
- Tilt-Table Testing: no role in exertional syncope, controversial in other settings due to poor sensitivity / specificity.
- Genetic Testing



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