SYNCOPE:
PRACTICAL CONSIDERATIONS

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Disclosures: None

SCOPE OF THE PROBLEM

• Cumulative lifetime incidence in general population up to 35 - 40%
• 1% of all hospital admissions
• 3% of all ER visits; up to 65% are vasovagal
• 6% incidence in institutionalized elderly
• Up to 15% incidence in ≥ Class III HF
• Prevalence: 7 - 47% in young, healthy subjects; unknown in elderly
• Up to 40% of patients may have no diagnosis established at hospital discharge
• 6% annual mortality if no cause established
• 12 - 25% recurrence

2015 Syncope
Kapoor Medicine 69:1990 N = 433 Sudden death: 37%

SURVIVAL IN SYNCOPAL PATIENTS

No syncope Vasovagal & other causes (OH, med Rx) Unknown cause Neurologic cause Cardiac cause

Soteriades et al NEJM 2002;347:878 (Framingham) N = 822/7814

2015 Syncope
ETIOLOGY OF FIRST SYNCOPE IN PATIENTS > 65 YEARS

- Reflex-mediated (VVS, CSS, situational) 13-30%
- Orthostatic 12%
- Cardiac
  - Arrhythmic 8%
  - Nonarrhythmic 3%
- Drug-induced 8%
- CNS 6%
- Unexplained 49%

Roussanov et al, Am J Geriatric Cardiol 2007;16:249 N=304 (VA patients)
FEATURES OF UNEXPLAINED SYNCOPE IN OLDER PATIENTS

- High incidence of comorbid conditions
- 24% recurrence rate
- Concurrent BP and HF Rx increases susceptibility to + HUT
- Lower diagnostic yield of history and tests compared in younger patients

Roussanov et al, Am J Geriatric Cardiol 2007;16:249 N=304 (VA patients)

PROGNOSIS IN UNEXPLAINED SYNCOPE IN PATIENTS > 65

Roussanov et al  Am J Geriatric Cardiol 2007; 16:249  N = 304 VA pts

2015 Syncope
EVALUATION OF SYNCOPE: PERTINENT HISTORY

- Precipitating factors
  - Posture changes (orthostatic hypotension)
  - Cough, swallowing, micturition, defecation ("situational" syncope)
  - Exercise (consider AS, HOCM, VT)
  - Head turning, Valsalva (suggests carotid sinus syndrome)
- Prodromal symptoms
- Speed of onset and recovery (prolonged recovery suggests vasovagal syncope)
- Aura (suggests seizure)
- Hx heart disease (predicts cardiac syncope: 95% specificity; sensitivity <50%)

EVALUATION OF SYNCOPE: PERTINENT HISTORY

- Drugs
  - Diuretics (→ hypokalemia, hypomagnesemia)
  - Digitalis (AVB, VT-classically bidirectional)
  - Antihypertensives
  - Antiarrhythmic agents (→ proarrhythmia)
  - Antianginal medications (preload and afterload reduction)
  - QT prolonging drugs (www.torsades.org)
  - OTC drugs
  - Herbs
  - Illicit drugs, alcohol
  - β-blockers (including ophthalmic)
- Family history of sudden death (congenital long QT syndrome, hypertrophic obstructive cardiomyopathy, Brugada)
- Known rhythm abnormality (e.g., WPW)
Exercise-induced RVOT VT
CLUES TO ETIOLOGY OF SYNCOPE FROM PHYSICAL EXAMINATION

- LV impulse abnormalities suggesting ICM, NICM
- Ventricular hypertrophy (need for AV synchrony)
- Ventricular gallops
- Murmurs (AS, HOCM)
- Pulmonary hypertension
- Carotid sinus massage indicating CSH
CAROTID SINUS MASSAGE

- Generally accepted contraindications
  - Carotid bruits
  - Prior endarterectomy
  - Prior TIA or CVA
  - Known cerebrovascular disease

- Responses to CSM
  - Bradycardia / asystole usually abrupt
  - Hypotension often not abrupt, and outlasts the CSM
  - Complications (< 1%): TIA, transient paresis, visual disturbances

CLUES TO ETIOLOGY OF SYNCOPE
FROM 12-LEAD ECG

- Long QT interval
- Prior MI (substrate for VT)
- Epsilon wave, anterior (V\textsubscript{1-3}) T inversion, QRS duration V\textsubscript{1-3} / V\textsubscript{4-6} > 1.2, suggesting RV cardiomyopathy
- Brugada pattern
- Short QT interval
- AV conduction delay / block
- Bifascicular block
- Ventricular hypertrophy (need for AV synchrony)
- Early repolarization

2015 Syncope
Epsilon wave of RV cardiomyopathy

BRUGADA ECG

2015 Syncope
BRUGADA SYNDROME

ROLE OF ECHOCARDIOGRAPHY IN SYNCOPE

- Aortic stenosis
- Hypertrophic cardiomyopathy (especially obstructive)
- Regional wall-motion disorders (substrate for VT)
- Arrhythmic ventricular cardiomyopathy
- Intracardiac tumor
- Repaired congenital heart disease
- Normal echo
Syncope in aortic stenosis

Recorded during syncopal spell. BP unobtainable.

Lead III: During syncopal spell

ST ELEVATION
SYNCOPE IN HYPERTROPHIC CARDIOMYOPATHY - 1

• Causes
  - SVT (especially AF)
  - VT
  - LV outflow tract gradient
  - Abnormal baroreceptor reflexes
  - Ischemia
• EP studies unreliable

SYNCOPE IN HYPERTROPHIC CARDIOMYOPATHY - 2

• ICD indicated for high risk patients
  - Aborted sudden death
  - Family hx syncope/sudden death
  - LVH > 3 cm
  - Nonsustained VT on Holter
  - Hypotension on exercise testing

2015 Syncope
NEUROCARDIOGENIC (VASOVAGAL) SYNCOPE

• Occurs at all ages
• 17 - 35% suffer significant injury
• 5 - 7% have fractures
• Up to 4% of pts diagnosed with VVS may have cardiac syncope

FEATURES OF HISTORY IN VVS

• Usually occurs in upright position
• Rare during exercise
• 3 phases: prodrome, loss of consciousness, postsyncopal period
• May have specific triggers (situational)
• Peri-event amnesia common
• Association with chronic fatigue syndrome, depression, somatic disorders
• May run in families
• ↑ frequency around menses
NEUROCARDIOGENIC SYNCOPE

- ↓ LV volume
- ↓ Venous return
- ↑ LV contractility

HEAD UP TILT

Peripheral venous pooling

Peripheral vasodilation

Mechanoreceptor stimulation (myocardial C fibers)

Vasomotor center

↑ Vagal tone

↓ α, β adrenergic tone

Bradycardia or asytole

Hypotension

2015 Syncope
ISOMETRIC ARM EXERCISE TO ABORT VASOVAGAL SYNCOPE

Control 2 min handgrip

HR
112
90
68
45
BP
178
156
133
111
89
67
44

Asx 11%  Syncope 47% | Asx 63%  Syncope 5%

Brignole et al  JACC 2002;40:2053  N = 19

SUSPECTED ARRHYTHMIC SYNCOPE WORKUP

- ECG
- Holter (overall yield 2-35%)
- Event Monitor
  (patient cannot be syncopal)
- Patch monitor
- Implantable loop recorder
- Head-up tilt table testing
- Electrophysiologic study
2015 Syncope
PATIENT PRESENTING WITH SYNCOPE AND SEIZURE

INDICATIONS TO REFER SYNCOPEAL PT TO ELECTROPHYSIOLOGIST

- Congenital long QT syndrome
- Brugada syndrome
- Structural heart disease
- Syncope in athletes
- Syncope during exercise
- Short QT syndrome