CLINICAL PEARLS

Diagnostic Dilemmas: CVD at Elderly Age

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<td>Research Grants/Contracts/Trial</td>
<td>Alnylam Pharmaceuticals, Gilead Sciences, NHLBI, Pfizer, Society for Women’s Health</td>
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<td>Safety and Monitoring Board</td>
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Background Information (1)

- Unprecedented growth of elderly population worldwide - aging predisposes to cardiovascular disease (CVD)
  - 19% US population > 65 by 2030
  - 19 million > age 85
  - Globally > age 85 ↑ 151% 2005→2030

- Geriatric cardiology = practice of CV medicine adapted to needs, complexities of older adults
  - Multimorbidity
  - Polypharmacy
  - Frailty
  - Cognitive decline
  - Social, financial, psychological dimensions of aging

Bell, J Am Coll Cardiol 66:1286, 2015
Background Information (2)

- Few data-driven studies to guide care for this vulnerable population
  - Patients outlived current data-driven recommendations
- Patient-centered outcomes, priorities vs disease-specific outcomes
- Transformative effect of aging on CVD
  - ↓ Capacity to tolerate, desire medications, devices, procedures vs younger patients
- Co-existing conditions affect health-related QOL, survival

Bell, J Am Coll Cardiol 66:1286, 2015
Case Study (1)

- 88 year old woman brought to ER by son for 4 hours of epigastric pressure, nausea, and dizziness
- PMH: diabetes, hypertension
- Lives independently, performs own activities of daily living
- Physical examination
  - Diaphoretic, mildly agitated
  - BP = 100/78 mmHg  HR = 100 bpm
  - Arterial O₂ = 94% 4L oxygen/min by nasal cannula
  - JVD = 8cm, bibasilar rales, + S₄
  - Wt = 120 lb
- Troponin = 0.28 ng/ml
- EKG → 3-4 mm ST elevation V₂ - V₆
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**Admission EKG**
Case Study (2)

- You explain she is having a heart attack and that the best treatment is coronary angiography to open the blocked artery.

- “No, doctor, I have indigestion and need something for my stomach”

- She agrees to have son help with decision and after discussion of risks and benefits both agree to diagnostic coronary angiography with intent for PCI reperfusion with stenting.
ACS in Older Adults (1)

- 35% myocardial infarctions in US in patients 75 and older (11% of patients > age 85)

- STEMI less common than NSTEMI in older adults, although absolute numbers of STEMI ↑ with ↑ age

- Older patients, particularly older women, often present with non-chest pain ischemic symptoms
  - Her “GI symptoms” represent myocardial ischemia
  - Also common: severe dyspnea, fatigue, dizziness, syncope
  - Confusion, altered cognition

- EKG diagnosis often complicated by
  - Abnormal baseline EKG – LVH, prior MI, AF, conduction disease
  - STEMI presenting with new LBBB more common at advanced age
ACS in Older Adults (2)

- Reperfusion associated with ↑ STEMI survival in older adults
- PCI favored over fibrinolytic therapy (at least to age 80) to ↓ 30-day mortality
  - Particular benefit anterior MI presenting > 6 hr after symptom onset, shock
  - ↓ hemorrhagic stroke PCI vs fibrinolytic therapy
  - Fibrinolytic Rx associated with ↑ risk myocardial rupture ≥ age 75 (17% vs 5% with PCI)
  - Major primary PCI benefit is ↓ recurrent ischemic events, ↓ need subsequent target vessel revascularization

Bueno, Eur Heart J 32:51, 2011
Boersma, Eur Heart J 27:779, 2006
Brass, Stroke 31:1802, 2000
Bueno, Eur Heart J 26:1705, 2005
Case Study (3)

- She is treated with aspirin, clopidogrel and unfractionated heparin* and urgently transferred to the cardiac catheterization laboratory.
- Beta blocker therapy is deferred due to IV beta blocker ↑ shock risk. ACE inhibitor and high intensity statin administered.
  - ↑ Cardiogenic shock risk (age > 70, SBP <120 mmHg, ST > 110 bpm, HR < 60 bpm, longer time since symptom onset)
- Coronary angiography → complete proximal LAD occlusion

* Wt-based dosing: 60 U/kg bolus with 12U/kg/hr infusion

O’Gara, Circulation 127:529, 2013
Pre-PCI Coronary Arteriogram

No LAD
Case Study (4)

- LAD dilation $\rightarrow$ sizeable clot burden, sluggish flow
- Bare metal stent $\rightarrow$ restoration of LAD flow
- To minimize complications a 75% lesion in mid RCA was not intervened on
- Post-procedure BP = 140/90 mmHg. Patient transferred to CCU
Large Thrombus Burden, TIMI 1 flow after “dotter”

LAD
That evening the nurse calls to report a BP of 75/50 mmHg, sinus tachycardia at 115/min, and a medium-sized hematoma at the groin site. Hgb is 8.1 g/dL
- BP stabilized with IV fluids
- 2 units packed rbc administered

She stabilizes with transfusion

Early ambulation, DVT prophylaxis with compression apparatus and secondary prevention medications instituted
- High intensity statin → greater benefit > age 65 than at younger age
**Bleeding Risk**

- ↑ Bleeding propensity in older adults
  - ? Age-related vasculopathy involving small hemostasis → impaired vascular healing
  - ? Loss of anatomic vasoreactivity
  - ? Immune incompetence

- Patient factors
  - Anemia, renal dysfunction, heart failure, diabetes
  - Female sex, low body weight, prior Hx bleeding, peripheral vascular disease

- Catheter-based interventions

- Inappropriate dosing of anticoagulants (weight, renal function based)

Alexander, JAMA 294:3108, 2005
Clinical Pearls: STEMI in Older Adults

- Systems for acute reperfusion
- Geriatric dosing of guideline-directed medical therapies
  - Altered pharmacokinetics (due to renal and/or hepatic dysfunction, reduced muscle mass, reduced volume of distribution)
  - Altered pharmacodynamics (↑ risk of bleeding, hypotension)
- Avoidance of bleeding complications
- Early mobilization, referral to cardiac rehabilitation
- Communication/information in care transitions

Kripalani, JAMA 297:831, 2007
Suaya, J Am Coll Cardiol 54:25, 2009
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**Diagnostic Challenges**

- Assessing symptoms amid multimorbidity, multiple causes
- Interpretation of diagnostic testing in context of age
- Diagnosing CV disease in relation to geriatric syndromes (falls, dizziness, syncope, weakness)
Diagnostic Assessment

- Typical CV symptoms: chest pain, dyspnea, dizziness, exercise intolerance
  - Less specific with age-related physiologic attrition
  - > 50% patients have 5 or more coexisting chronic conditions

- CVD underestimated
  - Treatment delays notorious
  - Utilities of therapies uncertain

- CVD also overdiagnosed, overtreated
  - Imaging studies reflect age-related vasculature, physiologic changes
  - Unrelated to presenting complaint, e.g., geriatric syndromes of falls, dizziness, syncope, weakness

Forman, Am J Cardiol 106:1382, 2010
Clinical Examples

- Dx atrial fibrillation simple
  - Complex is decision which 85 year old to anticoagulate, which agent to use

- Dx severe aortic stenosis frequent, established criteria
  - Complex is assessment of frailty, multimorbidity prohibitive of TAVR

- Clinical, angiographic indications for PCI established
  - Complex is decision when dementia, multimorbidity precludes use
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Geriatric Risk Assessment – Lack of Metrics to Incorporate:

- Multimorbidity
- Frailty – grip strength, gait speed
- Sarcopenia – fall history, orthostasis
- Cognitive impairment
- Functionality: maintenance of independence, avoidance of dependency
- Social limitations, stressors
- Requires expertise to incorporate physiologic age with biologic age

Boyd, J Gen Intern Med 29:552, 2014
Studenski, JAMA, 305: 50, 2011
Nasreddine, J Am Geriatr Soc 53:695, 2005
Distinctive Implications of Aging

• Older adults typically present with multiple concurrent disease states
  • Presentation, management CVD inherently more complex

• Geriatric syndromes part of multimorbidity – must address:
  • Frailty
  • Sarcopenia
  • Cognitive decline

• Cardiac medications: a balancing act
  • Evidence-based cardiac benefit
  • Risk of iatrogenesis (hypertension, syncope, falls)