Arrhythmia Management in the Heart Failure Patient
Drugs and Devices

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Overview

• Atrial Fibrillation
  – Rhythm Control vs. Rate Control

• Ventricular Arrhythmias
  – Medical and Device Management

• Device Programming
  – Strategies to Reduce Shocks

Atrial Fibrillation

• Overall population: 2%
  – Increases with age (20% over age 80)

• More prevalent in HF
  – NYHA Class I: 4%
  – NYHA Class IV: 40%
Rhythm or Rate?

- Permanent AF $\rightarrow$ CHF
  - rate control recommended
- CHF $\rightarrow$ AF
  - rhythm control = rate control for symptoms
  - sinus rhythm improves NYHA class, QOL
  - AF ablation (PVI) may improve symptoms

Yancy et al., 2013; Suman-Horduna et al., 2013
Medical Rate Control

• Beta-blockers
  – Metoprolol succinate
  – Carvedilol
  – Bisoprolol

Device-Based Rate Control

Pacemaker Implantation
  (consider CRT-P or CRT-D)

AV Node Ablation

Rhythm Control

• Medication Approach

• Device-Based Approach
Rhythm Control Medications

- **Class 1a**: Quinidine (not recommended)
- **Class 1b**: Mexiletine (adjunct to Class III)
- **Class 1c**: Propafenone, Flecainide (not safe to use in low EF)
- **Class II**: Beta-blockers (metoprolol, carvedilol, bisoprolol for CHF)
- **Class III**: Amiodarone, Sotalol, Dofetilide
  - (Dronedarone: not safe in decompensated HF)
- **Class IV**: Calcium Channel Blockers (not recommended in CHF)

Zipes et al., 2006; Yancy et al., 2013

Device-based Rhythm Control

- **Atrial overdrive pacing**
  - Device-based algorithms
- **AF ablation**
  - Similar efficacy to non-HF patients
  - Improved HF outcomes

Calkins et al., 2012

Case: Isabella

- 68 years old
- Ischemic CM, EF 37%
- Paroxysmal AF, sympt.
Case: Bert

- Nonisch CM, EF 40%
- AF refractory to amio, despite multiple CV

Ventricular Arrhythmias

- Medical Therapy
- Device Therapy

Medical Therapy: Antiarrhythmics

- Class 1a: Quinidine (not recommended)
- Class 1b: Mexiletine (adjunct to Class III)
- Class 1c: Not safe to use in low EF
- Class II: Beta-blockers
- Class III: Amiodarone, Sotalol, Dofetilide
  - (Dronedarone: not safe in decompensated HF)
- Class IV: Calcium Channel Blockers (not recommended in CHF)

Zipes et al., 2006; Yancy et al., 2013
Device Therapy: VT Ablation

• Adjunct to ICD implant
• Appropriate for sustained monomorphic VT

Device Therapy: ICD

• Class I
  – EF <35%, NYHA Class II, III
  – EF <30%, NYHA Class I
  – EF <40%, prior MI, inducible VT/VF
• Class IIa
  – Unexplained syncope, nonischemic DCM
  – Awaiting transplant, non-hospitalized

Epstein et al., 2008

• Class IIb
  – EF <35%, non-ischemic, NYHA Class I
• Class III
  – Less than 1 year life expectancy

Epstein et al., 2008
Device Programming to Prevent Shocks

- Atrial Fibrillation
- T-wave Oversensing
- Non-sustained Ventricular Tachycardia

Prevent Shocks from AF

- SVT discriminators (morphology, stability)
  - Device-based algorithm
- Rate control (beta blockers)
  - Medication therapy
- AV node ablation
  - Adjunct to pacemaker implantation
  - Consider CRT-P or CRT-D

Prevent Shocks from T-wave Oversensing

- Programmer-based algorithms
  - Medtronic: T-wave
  - St. Jude: Decay delay
  - Boston Scientific: RhythmID morphology
  - Sorin: Automatic ventricular sensitivity control
- Manual ventricular sensitivity adjustment
  - NIPS with DFT testing necessary
Preventing Shocks: NSVT

- **PainFREE Rx: Key Programming Takeaways**
  - Higher VF detection rate ≥200 bpm
  - Longer NID 30/40
  - Empiric ATP in all zones

  Wathen et al., 2004

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**Case: Rick**

- 60 years old
- Isch CM EF 20%
- Dual chamber ICD
- VT and PAF

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**References**