Update on the Management of Ventricular Arrhythmias

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New Cardiovascular Horizons 2017
Objectives

• Discuss prevalence of ventricular arrhythmias (VA) in the outpatient setting

• Review prognosis of VAs
  – Normal heart
  – Presence of structural heart disease

• Consider therapeutic options for management of VAs
Prevalence

• Approximately 1% on ECG (60 seconds)
• Up to 80% on 24 hour Holter
• Most have occasional premature ventricular contractions (PVCs)
• < 2 % have more than 20% PVCs
• More frequent with structural heart disease
Prognosis:

Normal Heart

• Greater than 2 x increase in mortality from coronary heart disease
• 2 x increase in sudden cardiac death
• Not always arrhythmia as cause of mortality
Prognosis: Structural Heart Disease

• Post Myocardial Infarct
  – Complex: > 10 PVCs/hr, nonsustained ventricular tachycardia

Maggioni et al, Circ 1993
Prognosis:
Structural Heart Disease

• Post Myocardial Infarct
  – Complex: > 10 PVCs/hr, nonsustained ventricular tachycardia
  – Suppression worsens mortality (class I antiarrhythmic drugs) or is mortality neutral (amiodarone)
Prognosis: Structural Heart Disease

• Nonischemic cardiomyopathy
  – PVCs: not clear if mortality is affected (infrequent PVCs)
  – NSVT: increased risk of mortality

• PVC mediated cardiomyopathy
  – Rare < 5,000-10,000 per day
  – > 20,000 per day associated with increased risk
Evaluation

• Palpitations, worsening fatigue, bradycardia
• Holter
• Echocardiogram
• Cardiac ischemia evaluation in selected patients

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<table>
<thead>
<tr>
<th>General</th>
<th>Heart Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>107230  QRS complexes</td>
<td>44 Minimum at 07:55:06 30-Dec</td>
</tr>
<tr>
<td>201 Ventricular beats (&lt; 1%)</td>
<td>75 Average</td>
</tr>
<tr>
<td>0 Supraventricular beats (&lt; 1%)</td>
<td>113 Maximum at 11:36:18 29-Dec</td>
</tr>
<tr>
<td>68 % of total time in AF/AFL</td>
<td>3959 Beats in tachycardia (&gt;100 bpm), 4% total</td>
</tr>
<tr>
<td>&lt; 1 % of total time classified as noise</td>
<td>13579 Beats in bradycardia (&lt;60 bpm), 13% total</td>
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<thead>
<tr>
<th>Heart Rates</th>
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<tbody>
<tr>
<td>2.2 Seconds Max R-R at 04:54:19 30-Dec</td>
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<thead>
<tr>
<th>Supraventriculars (S, J, A)</th>
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<tbody>
<tr>
<td>0 Isolated</td>
</tr>
<tr>
<td>0 Couplets</td>
</tr>
<tr>
<td>0 Bigeminal cycles</td>
</tr>
<tr>
<td>0 Runs totaling 0 beats</td>
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<th>General</th>
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<tbody>
<tr>
<td>108816 QRS complexes</td>
<td>70 Minimum at 20:40:47 10-Nov</td>
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<tr>
<td>933 Paced beats (&lt; 1%)</td>
<td>77 Average</td>
</tr>
<tr>
<td>31186 Ventricular beats (29%)</td>
<td>120 Maximum at 01:15:05 11-Nov</td>
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<tr>
<td>614 Supraventricular beats (&lt; 1%)</td>
<td>153 Beats in tachycardia (&gt;100 bpm), &lt; 1% total</td>
</tr>
<tr>
<td>&lt; 1 % of total time classified as noise</td>
<td>0 Beats in bradycardia (&lt;60 bpm), 0% total</td>
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<tr>
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<tr>
<td>1 Seconds Max R-R at 09:40:28 11-Nov</td>
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<tr>
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</tr>
<tr>
<td>0 Runs totaling 0 beats</td>
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Evaluation

• Symptom assessment
  – Palpitations, worsening fatigue, bradycardia
• Holter
• Echocardiogram
• Cardiac ischemia evaluation in selected patients
Therapy

• Goals
  – Decrease symptoms
  – Decrease risk of PVC mediated cardiomyopathy

• Caveats
  – Treat underlying cardiac pathology if present
  – Avoid complications/side effects
Therapy

• Caffeine avoidance
• Exercise, diet, biofeedback
• Potassium, magnesium supplementation
• Herbals, vitamin supplementation
Therapy

• 1\textsuperscript{st} – beta blockers
  – Metoprolol, nadolol, propranolol
  – Carvedilol, acebutolol

• 2\textsuperscript{nd} – calcium channel blockers
  – Diltiazem, verapamil

• 3\textsuperscript{rd} – antiarrhythmic therapy
  – Caution with class I AADs (flecainide, propafenone)
  – Amiodarone, sotalol in selected patients
Summary

- Nonsustained ventricular arrhythmias are often a marker of disease, and *not* often a primary cause of mortality
- VAs are associated with increased risk for adverse outcomes
- VAs can/should be treated for symptom control and prevention or therapy of VA-mediated cardiomyopathy
- Avoid therapy of infrequent, asymptomatic PVCs (or NSVT)—treat underlying cardiac pathology
- Avoid therapy of VAs with class I antiarrhythmic drugs in setting of structural heart disease
- Reserve amiodarone for sustained or symptomatic ventricular arrhythmias
EHRA/HRS/APHRS Expert Consensus on Ventricular Arrhythmias

Christian Torp Pedersen (EHRA Chairperson, Denmark), G. Neal Kay (HRS Chairperson, USA), Jonathan Kalman (APHRS Chairperson, Australia), Martin Borggrefe (Germany), Paolo Della-Bella (Italy), Timm Dickfeld (USA), Paul Dorian (Canada), Heikki Huikuri (Finland), Youg-Hoon Kim (Korea), Bradley Knight (USA), Francis Marchlinski (USA), David Ross (Australia), Frédéric Sacher (France), John Sapp (Canada), Kalyanam Shivkumar (USA), Kyoko Soejima (Japan), Hiroshi Tada (Japan), Mark E. Alexander (USA), John K. Triedman (USA), Takumi Yamada (USA), and Paulus Kirchhof (Germany)