Cardiology Corner: Electrical Storm

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PEARLS

- **Electrical storm** is defined as > 3 episodes of sustained ventricular tachycardia (VT), ventricular fibrillation (VF) or appropriate shocks from an AICD.

- Patients at risk for electrical storm
  - Underlying structural heart disease
    - Cardiomyopathy

        - Chagas disease
        - Arrhythmogenic right ventricular dysplasia/cardiomyopathy
    - Brugada syndrome
    - Post-cardiac surgery patients
    - Chronic renal failure
    - Patients taking antidysrhythmic medications
    - Patients with an AICD (up to 40% of patients)
- Reversible causes
    - Drug toxicity
    - Acute MI
    - Thyrotoxicosis
    - Electrolyte issues (HypoK, HypoMg)
    - CHF exacerbation
    - Increased sympathetic tone
- Evaluation (when patient not in VT or VF)
    - ECG
        - Check QTc interval
        - Look for ischemic changes or frank infarction
        - Look for underlying dysrhythmia (ie atrial fibrillation)
    - Have AICD interrogated
    - Check labs: electrolytes, thyroid function, troponin
- General treatment

PITFALLS ◆

- Avoid epinephrine as it can contribute to sympathetic stimulation and worsen storm.

    - Defibrillation
        - First line therapy
        - If electricity fails to terminate rhythm, consider changing pad placement of dual sequential defibrillation.
- Specific treatment based on rhythm
    - Treatment recommendations assume that the patient continues to experience dysrhythmia despite the application of electricity.

- Monomorphic VT
  - Regular and all QRS complexes look the same
  - Antidysrhythmic choices
    - Amiodarone
    - Lidocaine
    - Beta blockers
      - Non-selective (eg, propranolol)
      - To blunt increased sympathetic tone that stokes electrical storm
    - Empiric magnesium
- Polymorphic VT
  - Two types
    - Normal QTc: more associated with myocardial ischemia
    - Prolonged QTc: "Torsades de pointes"
  - Step 1: Cardioversion (with sedation if possible)
  - Step 2: Scrutinize ECG looking at QTc interval
    - Normal QTc: treat for myocardial ischemia, consider cath lab activation
    - Prolonged QTc: Aggressive magnesium loading

- Brugada Syndrome
    - Normal QTc polymorphic VT
    - Sodium channelopathy
      - Avoid sodium channel blockers such as amiodarone, procainamide, lidocaine.
    - Pharmacotherapy (if patient not currently in polymorphic VT): consider isoproterenol

Related Links

EM:RAP 2020 December: Dual Sequential Defibrillation

EM:RAP HD: Dual Sequential Defibrillation

CorePendium Chapter: Tachydysrhythmias