Acute Coronary Syndrome and a STEMI Patient: Cardiac Medications

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Objectives

- Goals of drug therapy
- Review what drugs are used acutely on presentation of Acute Coronary Syndrome (ACS)
- Review what drugs are used in treatment for a STEMI patient
- Review drugs for post-STEMI maintenance care

Goals of Drug Therapy

- Control chest pain and further ischemia
- Analgesic Therapy
- Anti-ischemic Therapy
- Reperfusion
- Antithrombotic Therapy
  - Percutaneous Coronary Intervention (PCI)
  - Treatment of choice
  - Fibrinolytic Therapy
  - Long Term Management/Prevention

Pharmacological management of patients with ACS/NSTEMI

Pharmacological management of patients with STEMI

Initial Management: Anti-ischemic Therapy

- Oxygen
- Aspirin (162-325 mg)
  - Non-enteric coated (chewable) for rapid absorption
  - Antiplatelet
- Nitroglycerin
  - Sublingual (tablet/spray) q5min up to 3 doses
  - Intravenous 5-10mcg/min (titrate to desired blood pressure and chest pain relief)
  - For persistent angina symptoms, hypertension
  - Vasodilator; relax venous system
- Contraindications:
  - Hypotension
  - Recent use in last 24-48hrs of phosphodiesterase inhibitors (sildenafil, vardenafil, tadalafil)
Anti-ischemic Therapy continued

- IV Morphine (2-4mg)
  - Persistent chest pain
- Beta-Blocker
  - Intravenous/oral
  - Reduce myocardial contractility & decrease heart rate
    - Reduces cardiac work load
    - Reduces myocardial oxygen demand
  - Caution/avoid in patients with heart failure (HF), low-output state or cardiogenic shock

Initial Management

<table>
<thead>
<tr>
<th>Anti-ischemic Therapy</th>
<th>Antiplaetelet Therapy</th>
<th>Anticoagulant Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>Aspirin</td>
<td>Heparin</td>
</tr>
<tr>
<td>Nitroglycerin</td>
<td>P2Y12 inhibitor</td>
<td>Enoxaparin</td>
</tr>
<tr>
<td>Morphine</td>
<td>GP IIb/IIIa inhibitor</td>
<td>Fondaparinux</td>
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<td>Beta-Blocker</td>
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<td>Bivalirudin</td>
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Antithrombotic Agents

- **Antiplaetelet Therapy**
  - To prevent total occlusion and decrease risk of thrombosis by interfering with platelet release and aggregation
  - Aspirin
    - Administer as soon as possible
  - Loading dose of 162-325mg non-enteric coated
  - P2Y12 inhibitors
    - Clopidogrel (Plavix)
    - Prasugrel (Effient)
    - Ticagrelor (Brilinta)
  - Glycoprotein IIb/IIIa inhibitors
    - Eptifibatide (Integrilin)
    - Tirofiban (Aggrastat)
    - Abciximab

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<tr>
<th>Antithrombotic Agents</th>
<th>Loading dose for PCI</th>
<th>Maintenance dose</th>
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<tr>
<td>Clopidogrel (Plavix)</td>
<td>600mg</td>
<td>75mg Daily</td>
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</tr>
<tr>
<td>Prasugrel (Effient)</td>
<td>60mg</td>
<td>10mg Daily</td>
<td>Contraindicated in patients with a history of stroke/TIA</td>
</tr>
<tr>
<td>Ticagrelor (Brilinta)</td>
<td>180mg</td>
<td>90mg Twice Daily</td>
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Antithrombotic Agents

- **Glycoprotein IIb/IIIa inhibitors**
  - Eptifibatide (Integrilin); Tirofiban (Aggrastat); Abciximab
  - Used during PCI
  - Reduces ischemic complications
  - Are used on an individual basis for high risk patients and thrombus burden per MD request
  - They are used with anticoagulants in select patients
  - Triple antiplatelet therapy is associated with increased risk of bleeding (benefit vs risk)

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Anticoagulant Therapy

- Parenteral anticoagulants are used during the initial management of ACS
- Used no matter what reperfusion therapy (PCI/fibrinolytic therapy) is used
  - Heparin
  - Low-molecular weight heparin (Enoxaparin/Lovenox)
  - Fondaparinux (Arixtra)
    - Not used with PCI due to increased risk of catheter thrombosis
  - Bivalirudin (Angiomax)
    - Used in patients with a high risk of bleeding
    - Used during PCI and usually discontinued at completion of PCI
    - Adjunctive use of GP IIb/IIIa inhibitors is not recommended but may be considered in select patients

Fibrinolytic Therapy

- Used when there is an anticipated delay for PCI or not able to perform PCI
  - Onset of ischemia symptoms within 12hrs and it is anticipated that PCI cannot be done within 2hrs
  - Works by lysis of the thrombi to restore perfusion
  - Tenecteplase (TNK-tPA)
  - Retepase (rPA)
  - Alteplase (tPA)
  - Several contraindications to fibrinolytic therapy
    - Intracranial hemorrhage (prior)
    - Ischemic stroke within the past 3 months
    - Active bleeding
    - Closed-head or facial trauma within 3 months
    - Intracranial or spinal surgery within 2 months
    - Severe uncontrolled hypertension

Fibrinolytic Therapy continued

- Used in combination with adjunctive antiplatelet therapy
  - Aspirin 162-325mg (as part of initial management)
  - P2Y12 Inhibitor
    - Clopidogrel (Plavix)
    - 300mg loading dose, 75mg if >75 year old
  - Use with anticoagulants
    - Use until revascularization (PCI) is performed
    - At least 48hrs or for the duration of hospital stay

Maintenance Therapy Post-STEMI

- Antiplatelet
- Beta-Blocker
- Angiotensin-converting enzyme (ACE) Inhibitor/ARB (angiotensin receptor blocker)
- Aldosterone Antagonist
- Statin

Maintenance Therapy

- Antiplatelet
  - Aspirin 81mg daily
    - Indefinitely
  - P2Y12 Inhibitor
    - Plavix 75mg daily; Effient 10mg daily; Brilinta 90mg Twice daily
    - For at least >12 months
- Beta-Blocker
  - Unless contraindicated (calcium channel blocker may be an option)
  - Angiotensin-converting enzyme (ACE) Inhibitor/ARB (angiotensin receptor blocker)
    - Recommended to add within the first 24hrs of a STEMI patient with CHF, EF <40%, diabetes
    - ARB if intolerant of ACE
- Aldosterone Antagonist
  - Spironolactone (Aldactone); Eplerenone (Inspra)
  - Add if patient is already on ACE-ARB and a beta-blocker with EF <40%
- Statin
  - High-intensity therapy should be initiated/continued
    - Example: atorvastatin (Lipitor) >/= 40mg, rosuvastatin (Crestor) >/= 20mg
References


