Treatment of ACS
Michael P. Gulseth, Pharm. D., BCPS
Pharmacotherapy II
Spring 2006

Objectives
• Define “early invasive strategy” and what patients typically receive this approach
• Compare/contrast the medications administered to patients with UA/NSTEMI vs. STEMI
• List the contraindications to “lytic” use
• Describe additional drug therapies (not directly related to ACS) that must be considered for ACS patients
• Describe non-drug patient education needed for ACS patients

“Early Invasive Strategy”
• ACC/AHA guidelines strongly advocate for early revascularization of medium to high risk UA/NSTEMI patients
  – What types of patients would fall in this group?
  – What type of revascularization is used in these patients?

UA/NSTEMI General Concepts
• Fibrinolytics are NOT used
• Clopidogrel is used together with aspirin in most patients
• Glycoprotein (Gp) IIb/IIIa agents are typically used in patients receiving a PCI
• If you don’t know these above points, you will not do well on my portion of the exam!

UA/NSTEMI Initial Therapy/Anti-Ischemic
• Initial drug therapy should consist of:
  – SL followed by IV NTG to relieve symptoms
    • Why? (hint: supply vs. demand....)
    • How would you dose?
    • What side effects would you expect?
    • Contraindications?
  – Morphine given IV for pain not relieved by SL NTG
    • Why?
  – Beta-blocker given IV followed by oral therapy
    • Why?
    • Anyone know which drug is typically used?
    – Verapamil or diltiazem if beta-blocker contraindicated if no evidence of left ventricular (LV) dysfunction

UA/NSTEMI Initial
Therapy/Antithrombotic
• Aspirin is the preferred initial anti-platelet therapy
  – Initial dose 162-325 mg, chew and swallow, then 75-160 mg daily
  – Clopidogrel substituted if patient cannot tolerate aspirin
• Clopidogrel is added when the MD knows a patient will not need a CABG
  – Usually after a stent is placed
  – 1st dose is 300-600 mg then 75 mg po daily
  – Continued 1-9 months and depends on what type of stent placed
    • Bare metal—1 month; sirolimus—3 months; paclitaxel—6 months
  – Note clopidogrel needs to be held 5-7 days before a CABG
    • Why?
    – Use 81 mg of aspirin, please
UA/NSTEMI Initial Therapy/Antithrombotic

- Antithrombin therapy with either heparin (UFF), low-molecular-weight-heparin (LMWH), or a direct thrombin inhibitor (bivalirudin) until PCI or 48 hours if treated medically
- GP IIb/IIIa inhibitor (usually eptifibatide or abciximab)
  - Particularly if someone is undergoing a PCI; questionable benefit without at PCI
    - 30 poor outcomes prevented in 1000 PCI patients: NNT 32
    - 4 poor outcomes prevented in 1000 non-PCI patients: NNT 250
  - Abciximab is ONLY used if the patient will have PCI

STEMI General Concepts

- STEMI patients need to be quickly revascularized
  - Why?
- How are they revascularized?

STEMI Reperfusion

- In general, primary PCI is preferred over lytics when primary PCI is possible
  - Must be 90 minutes from presentation
  - Meta-analysis indicate mortality lower with primary PCI
  - Opens 90% of occluded arteries compared to 60% with lytics
  - Lower bleeding risk
  - Also indicated if contraindications to lytics
  - Most hospitals can’t do this!

Contraindications to Lytic Therapy

- Absolute
  - Active internal bleeding (not menses)
  - Previous intracranial hemorrhage
  - Ischemic (thrombotic) stroke within 3 months
  - Intracranial neoplasm
  - Structural vascular lesion (like arteriovenous malformation)
  - Suspected aortic dissection
  - Significant closed head or facial trauma within 3 months

Contraindications to Lytic Therapy

- Relative
  - Severe, uncontrolled hypertension on presentation (BP > 180/110 mm Hg)
  - History of prior ischemic (thrombotic) stroke > 3 months, dementia, or known intracranial pathology not covered in absolute contraindications
  - Current anticoagulant use
  - Known bleeding diathesis
  - Active peptic ulcer
  - History of severe, chronic poorly controlled HTN

- Relative
  - Traumatic or prolonged (> 10 min) CPR or major surgery (< 3 weeks)
  - Noncompressible vascular puncture (like recent liver biopsy or carotid artery puncture)
  - Recent internal bleeding (2-4 weeks)
  - If streptokinase, prior use (5 days-2 years) or known allergic response
  - Pregnancy
STEMI Initial Therapy/Anti-Ischemic

• Initial drug therapy should consist of:
  – SL followed by IV NTG to relieve symptoms
  – Morphine given IV for pain not relieved by SL NTG
  – Beta-blocker given IV followed by oral therapy

STEMI Initial Therapy/Antithrombotic

• Aspirin is the preferred initial anti-platelet therapy
  – Initial dose 162-325 mg, chew and swallow, then 75-160 mg daily
  – Clopidogrel substituted if patient cannot tolerate aspirin
• Antithrombin therapy with heparin continued until PCI or at least 24 hours if lysed
  – Heparin not used if streptokinase
• Fibrinolysis if candidate or primary PCI

More on Lytic Use

• Goal is 30 minutes from initial emergency system presentation to lytic administration
• Most effective if used within 12 hours of symptom onset
• Small benefit between 12-24 hours of symptom onset
• Not beneficial if > 24 hours of symptom onset
• No need to wait for biochemical conformation if conclusive ECG available

Lytics and the Elderly

• For patients > 75 years-old:
  – Intracranial hemorrhage risk is 2% versus 1% in younger patients
  – Lytics can lead to hemorrhagic strokes
  – AHA/ACC still advocate for use in elderly if no contraindications
    • Risk versus benefit

More on Lytic Use

• AHA/ACC prefer used of more fibrin specific lytics like alteplase, reteplase, or tenecteplase over less specific agents like streptokinase
• Alteplase reduced mortality by 1% over streptokinase
  – $30,000 per life saved increase cost
• Tenecteplase or reteplase are the typical agents chosen due to dosing considerations to be discussed later

STEMI and Gp IIB/IIIA

• Only used if undergoing “primary PCI”
• Based on evidence, abciximab is the preferred agent
  – IIB/IIIA ONLY USED IF PRIMARY PCI!!!!
  – Clopidogrel also given for at least 4 weeks and maybe longer depending on the type of stent (see non-STEMI comments)
  – Can be continued for 12 months after procedure
All MI Discharge Medications

- SL NTG tablets or spray
- Aspirin 75-162mg daily
- Clopidogrel 75 mg daily if aspirin not tolerated or with aspirin if a stent was placed
  - How long must this be continued with a stent?
  - Can it go longer than standard stent time?
- Beta blocker if no contraindications
- Lipid lowering agents if LDL > 100
  - Need cholesterol levels drawn within 24 hours
  - Pretty standard to give to all
- ACE inhibitor, particularly if left ventricular dysfunction, use ARB if not tolerated
  - How do you think this helps?

Optional MI Therapies

- Warfarin
  - Left ventricular thrombus
  - Extensive ventricular wall motion abnormalities
  - Chronic a. fib.
  - History of thromboembolic disease
- What to do with a. fib. and new stent?
- Aldosterone antagonism
  - Spironolactone
  - Eplerenone
  - Consider either within first 2 weeks of STEMI if already on ACE inhibitor with EF of < 40% and either heart failure symptoms or diabetes mellitus
  - How do you pick and what would you be worried about?

Additional Important MI Issues….

- Blood pressure control
  - What guideline would you utilize?
- Diabetes control
  - Infusions for the first 24-48 hours in complicated patients
  - Goal HgA1c < 7%
- Smoking cessation counseling
- Weight management
  - Goal BMI 18.5-24.9-begin diet if above; I am 25.1!
- Exercise
  - Minimum goal 3-4 times/week for 30 minutes each
- How much of ACS is preventable???????

Why do I have to know this?

- Story time……...
- You are consulted as part of a pain management team to see a patient on the orthopedic unit at Fairview Southdale Hospital in Edina, MN…….

Review

- Let’s walk through how a couple of cases would be handled to tie it all together…..(you may want to take some notes)

Review Questions

- What is an “early invasive strategy?”
- What patients get lytics? What patients can get abciximab? What patients get clopidogrel? How long is clopidogrel used?
- What are some contraindications to lytic use?
- What patients should have insulin infusions?
- What type of non-drug education do MI patients need?
Panel A

Goals†

Patient After symptom onset: 5 min
Dispatch: 1 min
EMS on scene: Within 8 min
Prehospital fibrinolysis: EMS-to-Needle within 30 min
EMS transport: EMS-to-Balloons within 90 min
Patient self-transport: Hospital Door-to-Balloons within 90 min

Total ischemic time: Within 120 min*

*Golden Hour = First 60 minutes

Panel B

Fibrinolysis → Noninv. Risk Stratification → Late Hosp Care & Secondary Prev

PCI or CABG → Primary PCI → Receiving Hospital

Not PCI capable → PCI capable