Acute Myocardial Infarction in Older Adults

Description/Etiology

Acute myocardial infarction (AMI; commonly called a heart attack) is a medical emergency characterized by necrosis of a local area of the heart muscle secondary to an abrupt and prolonged interruption of blood and oxygen supply. AMI is most commonly caused by a thrombus that partially or totally blocks a coronary artery that has previously been narrowed from the buildup and rupture of an atherosclerotic plaque. (For more information, see Quick Lesson About … Acute Myocardial Infarction.) Older adults with AMI frequently experience atypical signs and symptoms, including mild or no pain (called a silent AMI), epigastric pain, changes in mental status (e.g., confusion), syncope, and/or shortness of breath. AMI in older adults is more likely to be associated with heart failure and higher in-hospital mortality than AMI in younger adults. Complications of AMI in older adults include left ventricular aneurysm, cardiogenic shock, stroke, deep vein thrombosis, heart failure, pulmonary embolism, hyperglycemia, cardiac arrhythmias, ventricular and/or papillary muscle rupture, pericarditis/Dressler syndrome, cardiac arrest, and sudden death.

Diagnosis of AMI is made based on clinical presentation and results of laboratory findings, electrocardiogram (EKG) readings, and imaging studies. Treatment combines emergency and maintenance medications with supportive therapy. Invasive procedures (e.g., percutaneous coronary intervention; coronary artery bypass graft surgery; implantation of an automatic cardioverter defibrillator; intra-aortic balloon counter pulsation; laser, mechanical, chemo-, or radioablation therapy), although more commonly performed in younger patients, can improve post-AMI prognosis in older adults if not contraindicated for other reasons. Prognosis varies and depends on the size, type, severity, and location of infarct and the amount of remaining functional cardiac muscle. In general, prognosis worsens with advanced age or the presence of arrhythmias, post-AMI angina, pericarditis, or concomitant illnesses (e.g., diabetes mellitus [DM]). Making certain lifestyle changes and adherence to the prescribed medication regimen can reduce risk of repeat AMI.

Facts and Figures

An AMI occurs in the United States every 42 seconds. An estimated 550,000 new and 200,000 recurrent AMIs occur in the U.S. each year; in addition, ~ 160,000 additional patients have a silent AMI. AMI is more common in men than in women between the ages of 40 and 70 years; after 70 years of age, no sex predilection exists. The average age at first AMI is 65.1 years in men and 72.0 years in women. Post-AMI mortality rates increase with advancing age. Among individuals aged 65–74 years, 14% of White men, 18% of White women, 22% of Black men, and 21% of Black women will die within 1 year of suffering an AMI. Among those aged ≥ 75 years, 1-year post-MI mortality rates are 27% for White men, 29% for White women, 19% for Black men, and 31% for Black women.

Risk Factors

Risk factors for AMI in older adults include atrial fibrillation, DM, hypertension, tachypnea, dyslipidemia, Black race/ethnicity, and low socioeconomic status. Lifestyle risk factors include cigarette smoking, obesity, a high-fat diet, and lack of exercise. Other risk factors include elevated levels of homocysteine, C-reactive protein, and fibrinogen. Psychological risk factors include depression, anger, hostility, and chronic stress.
Signs and Symptoms/Clinical Presentation

Although older adults often have signs and symptoms of AMI that are typical at any age, older adults often experience the atypical signs and symptoms of syncope, weakness, confusion or delirium, dyspnea, diaphoresis, nausea, epigastric distress, and intermittent claudication.

Assessment

› Physical Findings of Particular Interest
  • Physical findings can include tachycardia or bradycardia, extreme anxiety and restlessness, palpitations, diaphoresis, skin pallor, hypertension or hypotension, jugular venous distension, and abnormal breath or heart sounds
  • 3rd and 4th heart sounds can indicate abnormal left ventricular function
  • Pulmonary rales and hypotension can be present

› Laboratory Tests That Might Be Ordered
  • Serum cardiac enzymes and specific cardiac biomarkers—including cardiac specific troponin T and cardiac specific troponin I, creatinine kinase (CK) and CK-MB isoenzymes, lactate dehydrogenase (LDH), and LDH1 isoenzyme—can be elevated, indicating cardiac muscle necrosis
  • CBC might indicate anemia, increased WBC, and/or elevated erythrocyte sedimentation rate, indicating an inflammatory process
  • Triglyceride levels and low-density and/or very low-density lipoprotein cholesterol levels might be elevated; high-density lipoprotein cholesterol level might be decreased

› Other Diagnostic Tests/Studies
  • 12-lead EKG might show ST-segment depression and Q waves or peaked T waves; continuous cardiac monitoring might indicate arrhythmias
  • Echocardiography can be ordered to evaluate for cardiac wall motion abnormalities
  • Chest X-ray might show aortic dissection, pneumothorax, or heart failure
  • Myocardial perfusion scanning can be ordered to evaluate for abnormalities in blood-flow pattern to the heart walls
  • Nuclear ventriculography studies can show acutely damaged cardiac muscle, prior AMI, or coronary artery blockages
  • Coronary angiography can show vessel blockage or lesions

Treatment Goals

› Promote Optimum Cardiac Status and Reduce Risk of AMI Complications
  • Assess patient status and assist with emergency resuscitation efforts, as appropriate
  • Provide supplemental O₂ via nasal cannula at moderate flow rates, as ordered. Place the patient on telemetry and obtain serial EKGs to monitor for arrhythmias. Closely monitor all physiologic systems for developing complications, including by pulmonary artery (Swan-Ganz) hemodynamic monitoring
  • Administer medications, as ordered, which typically include streptokinase or tissue plasminogen activator followed by infusion of heparin (e.g., enoxaparin) for thrombolysis, aspirin and/or clopidogrel to inhibit platelet aggregation, beta-blockers (e.g., metoprolol) to decrease blood pressure and/or treat dysrhythmias, nitroglycerin for angina, statins (e.g., atorvastatin, lovastatin) to lower cholesterol levels, ALPRAZolam for anxiety, LORazepam for sedation, and morphine sulfate or meperidine for pain
    – Monitor for side effects of all medications, especially for intracranial bleeding in patients > 65 years of age who are receiving thrombolytic therapy
  • Maintain bed rest and assist the patient with use of a bedside commode for at least the first 24–48 hours after AMI. Assist with range-of-motion exercises, as ordered
  • Follow facility pre- and posttreatment protocols if patient becomes a candidate for a procedure or surgery; reinforce pre- and posttreatment education and verify completion of facility informed consent documents
    – Monitor for posttreatment complications, including pain, infection, and bleeding at the surgical site, and report abnormalities to the treating clinician

› Promote Emotional Support and Educate to Relieve AMI-Related Anxiety
  • Assess patient anxiety level, coping ability, cognitive status, and for knowledge deficits regarding AMI; provide emotional support and educate about AMI, including risk factors, treatment risks and benefits, and individualized prognosis
  • Request referral to a mental health clinician, as appropriate, for counseling on coping strategies
Food for Thought
› Older adults can have a particularly subtle presentation of AMI, with manifestations limited to fatigue, syncope, or weakness
› Researchers in a study of 36,771 patients aged ≥ 65 years who survived an MI found that increasing age was associated with reduced use of standard medical and interventional therapies, other than beta-blockers. Rates of cardiac catheterization decreased from 78.7% in patients aged 65–79 years to 15.5% of patients aged ≥ 90 years. The use of percutaneous coronary intervention decreased from 44.3% in patients aged 65–79 years to 9.8% of patients aged ≥ 90 years. Prescriptions for statins at discharge were 80.9% and 56.0% in these age groups, respectively (Lopes et al., 2015)
› Higher glycosylated hemoglobin (HbA1c; i.e., a measure of long-term average blood glucose concentration) appears to be associated with increased risk of MI in older adults, even among those without DM. In a study of 736 individuals aged ≥ 85 years without known DM, participants with a baseline HbA1c of 5.7–6.5% were 3.6 times more likely than those with a baseline HbA1c of 5.0–5.7% during the 5-year follow-up (Birkenhager-Gillesse et al., 2015)

Red Flags
› Risk of death is higher in older adults who develop atrial fibrillation after AMI
› Nitrates are contraindicated in patients who have recently used PDE-5 inhibitors

What Do I Need to Tell the Patient/Patient’s Family?
› Educate to call 9–1–1 or seek immediate medical attention for the development of crushing chest pain or atypical signs and symptoms (e.g., fatigue, weakness, confusion)
› Educate about aspirin administration, if prescribed, and potential side effects (e.g., bleeding)
› Encourage adherence to the prescribed medication regimen; educate about lifestyle changes, including smoking cessation, weight loss, regular exercise (e.g., attending a cardiac rehabilitation program following approval by the treating clinician), and sodium and sugar restriction, if applicable, to reduce coronary risk. Encourage receiving annual vaccination against seasonal influenza

References