Tikrit university

College of Nursing

Clinical Nursing Science

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Critical Care Nursing

(Myocardial Infarction)

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Myocardial infarction

Definition

Myocardial infarction(MI) is the term used to describe irreversible myocardial necrosis (cell death) that results from an abrupt decrease or total cessation of coronary blood flow to a specific area of the myocardium. In the hospital, this is often referred to as an acute MI, indicating the sudden onset and the life-threatening nature of the event.

Etiology and pathophysiology of MI:

MI almost always occurs in patients who have atherosclerosis. Three mechanisms can block the coronary artery and are responsible for the acute reduction in oxygen delivery to the myocardium: (1) plaque rupture, (2) new coronary artery thrombosis, and (3) coronary artery spasm close to the ruptured plaque.

Clinical features of MI: The classic symptom of MI in most patients is acute chest pain. However, some patients may present with more vague symptoms.

- Typical:
  - Chest pain
    - Retrosternal
    - Dull, squeezing/pressure-like pain
    - May radiate to the left arm, shoulder, or jaw
    - Usually constant, lasting ≥ 20–30 minutes, not relieved by rest or nitrates.
  - Diaphoresis
  - Dyspnea
  - Nausea and vomiting
  - Epigastric pain (with inferior-wall MI)
  - Palpitations
- Atypical presentation more common in women, the elderly, or patients with diabetes
  - Absence of chest pain or atypical locations

Physical examination

- Vitals:
  - Tachycardia
  - Bradycardia
- Skin:
  - Cool
  - Pale or cyanotic

- Diaphoretic(sweating)

Diagnosis

Patients presenting with a history of acute chest pain or suspicious atypical symptoms are evaluated with ECG. Cardiac troponin levels should be obtained within 10 minutes of the patient's arrival in the emergency department, Abnormalities in both confirm the diagnosis of MI.

***ECG:** The initial ECG may be normal or non-diagnostic in one-third of cases, need close observation and repetition of ECG testing.

- Findings in STEMI and their evolution:
  - Tall, peaked (hyperacute) T waves may be seen early in the course.
  - ≥ 1-mm ST elevation in ≥ 2 contiguous leads
  - Reciprocal ST depression
- Findings in NSTEMI:
  - ST depression (not elevations)
  - Nonspecific changes
  - Inverted T waves

***Cardiac enzymes:** Structural proteins in the heart that are released as a result of myocardial injury

- Troponin I:
  - Serum levels:
    - Start to ↑ within 2–3 hours after the onset of chest pain
    - Peak levels at 12–48 hours
    - Return to baseline over 4–10 days
  - Highest sensitivity and specificity (compared to other cardiac enzymes)

Treatment :Prompt recognition of the diagnosis of acute MI is imperative in order to realize the benefit from reperfusion therapy.

- Oxygen
- Treat ventricular arrhythmias (if present).
- Aspirin:
  - Prevents thrombus formation/expansion
- Morphine:
  - Provides relief of ischemic pain
  - ↓ Anxiety

Reperfusion

- percutaneous coronary intervention(PCI): For patients who present ≤ 2 hours after the onset of symptoms → PCI with drug-eluting stent to prevent restenosis, if available
- If PCI is not readily available, then thrombolytic agents(Streptokinase and alteplase) are recommended for reperfusion:
  - Consider fibrinolytic therapy in patients with ≤ 12 hours of symptoms.

    - All are contraindicated with active bleeding, recent stroke, or suspected aortic dissection
- Coronary artery bypass graft(CABG)surgery after MI if:
    - Failure of thrombolytics or PCI to reperfuse damaged myocardium.

Nursing Care for MI:

1. Administer oxygen along with medication therapy to assist with relief of symptoms.

2. Encourage bed rest with the back rest elevated to help decrease chest discomfort and dyspnea.

3. Encourage changing of positions frequently to help keep fluid from pooling in the bases of the lungs.

4. Check skin temperature and peripheral pulses frequently to monitor tissue perfusion.

6. Monitor the patient closely for changes in cardiac rate and rhythm, heart sounds, blood pressure, chest pain, respiratory status, urinary output, changes in skin color, and laboratory values.

6. Client education, regarding exacerbating factors and advocates healthy life style.