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Case Report on Myocardial Infarction

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Abstract: ***Myocardial infarction (MI) is a life-threatening cardiac emergency resulting from reduced or absent coronary blood flow, usually secondary to atherosclerotic plaque rupture and thrombus formation. Prompt recognition and evidence-based interventions are critical to survival and long-term outcomes. This report presents the case of a 58-year-old male admitted to the Cardiac Ward, Maharani Lakshmi Bai Medical College, Jhansi, with acute inferior wall myocardial infarction. The patient's clinical presentation, investigations, nursing diagnoses, interventions, and outcomes are discussed in detail. This case underscores the role of nursing in acute cardiac care, patient education, and lifestyle modification to prevent recurrence.***

Keywords: Myocardial infarction, acute coronary syndrome, nursing management, case study, cardiac rehabilitation

1. Introduction

Cardiovascular diseases remain the foremost cause of morbidity and mortality worldwide, with myocardial infarction contributing significantly to this burden (World Health Organization, 2023). Myocardial infarction occurs when oxygen supply to myocardial tissue is severely reduced due to coronary artery obstruction, leading to ischemia and necrosis. Early recognition and intervention are essential to minimize myocardial damage, prevent complications, and improve prognosis.

Nurses are integral members of the cardiac care team, providing continuous monitoring, immediate interventions, and holistic care to patients during acute MI and recovery. This case study highlights the presentation, management, and nursing care of a patient admitted with myocardial infarction in the Cardiac Ward of Maharani Lakshmi Bai Medical College, Jhansi.

Chief Complaint

Severe retrosternal chest pain radiating to the left arm, associated with shortness of breath, diaphoresis, and nausea, lasting for more than 30 minutes.

Clinical Findings

- **Vital signs:** BP 160/100 mmHg, HR 110 bpm (irregular), RR 26/min, SpO_2 89% (room air)
- **General examination:** Anxious, pale, and diaphoretic
- **Systemic findings:** Basal crackles in lungs, tachycardia without murmurs

Investigations and Clinical Significance

- **Electrocardiogram (ECG):** The patient's ECG showed ST-segment elevation in leads II, III, and aVF, which is diagnostic of an acute inferior wall myocardial infarction. Inferior wall involvement suggests occlusion of the right coronary artery or, less commonly, the left circumflex artery.
- **Troponin-T (2.5 ng/mL, elevated):** The significant elevation of cardiac troponin confirmed myocardial necrosis. Troponins are highly specific and sensitive biomarkers for myocardial infarction, and levels above the normal range strongly indicate cardiac muscle damage.
- **Chest X-ray (mild pulmonary congestion):** The presence of pulmonary congestion indicated early left ventricular dysfunction due to impaired myocardial contractility. This finding correlated with the patient's dyspnea and basal lung crackles.
- **Echocardiography (inferior wall hypokinesia, ejection fraction 45%):** Echocardiography revealed regional wall motion abnormality, specifically hypokinesia of the inferior wall, consistent with the infarct location. The reduced ejection fraction (45%) reflected moderate impairment of left ventricular function, highlighting the extent of myocardial damage.

Nursing Diagnoses (NANDA-I Approved)

1) **Acute Pain (NANDA Code: 00132)**
   Related to: Decreased myocardial oxygen supply
   Evidenced by: Patient's verbal report of severe chest pain radiating to the left arm, diaphoresis, and restlessness.
2) **Decreased Cardiac Output (NANDA Code: 00029)**
   Related to: Impaired myocardial contractility secondary to myocardial infarction
   Evidenced by: Tachycardia, hypotension, low oxygen saturation, and echocardiographic findings of reduced ejection fraction.
3) **Anxiety (NANDA Code: 00146)**
   Related to: Threat of death, hospitalization, and unfamiliar environment
   Evidenced by: Patient's verbal expression of fear, restlessness, tachypnea, and anxious appearance.
4) **Risk for Decreased Cardiac Tissue Perfusion (NANDA Code: 00201)**
   Risk factors include: Arrhythmias, ongoing myocardial ischemia, and potential heart failure following infarction.

Treatment Plan Based on Investigations

1) **Electrocardiogram (ECG – Inferior Wall STEMI):**
   a) **Treatment:**
      - Immediate administration of **antiplatelet therapy** (Aspirin 300 mg and Clopidogrel 300–600 mg loading dose) to prevent further thrombus formation.

- **Reperfusion therapy** thrombolytic therapy with agents like Streptokinase/Tenecteplase **Oxygen supplementation** to maintain $SpO_2 > 94\%$.
- **Nitroglycerin infusion** for chest pain (unless contraindicated by hypotension or right ventricular infarction).
- **Morphine** for severe pain and anxiety relief.

b) **Rationale:** ECG changes confirm STEMI; early reperfusion is the cornerstone of treatment to salvage ischemic myocardium.

2) **Troponin-T (Elevated 2.5 ng/mL – Confirmed Myocardial Necrosis):**
   a) **Treatment:**
      - Initiation of **anticoagulant therapy** (Unfractionated Heparin or Low Molecular Weight Heparin such as Enoxaparin) to reduce further thrombus propagation.
      - **Beta-blockers** (e.g., Metoprolol) to decrease myocardial oxygen demand, provided no contraindications like severe hypotension or bradycardia.
      - **High-intensity statin therapy** (e.g., Atorvastatin 80 mg) to stabilize atherosclerotic plaques and reduce future events.
   b) **Rationale:** Elevated troponins confirm necrosis, necessitating aggressive cardioprotective pharmacotherapy to prevent extension of myocardial injury.

3) **Chest X-ray (Mild Pulmonary Congestion):**
   a) **Treatment:**
      - **Diuretics (e.g., Furosemide IV)** to reduce pulmonary congestion and relieve dyspnea.
      - Careful **fluid balance monitoring** with hourly urine output measurement.
      - **Oxygen therapy** continued to address hypoxemia.
   b) Rationale: Pulmonary congestion reflects early left ventricular failure, requiring diuretic therapy to prevent worsening pulmonary edema.

4) **Echocardiography (Inferior Wall Hypokinesia, EF 45%):**
   a) **Treatment:**
      - **ACE inhibitors (e.g., Ramipril/Enalapril)** to reduce afterload, improve ventricular remodeling, and preserve left ventricular function.
      - **Long-term beta-blockers** and **aldosterone antagonists** (e.g., Spironolactone if EF ≤ 40% or symptomatic).
      - Enrollment in a **cardiac rehabilitation program** focusing on gradual exercise, dietary modification, and smoking cessation.
   b) **Rationale:** Moderate impairment of LV function warrants early initiation of heart-failure–preventive drugs and long-term risk reduction strategies.

Summary of Integrated Treatment:
- **Acute phase:** Antiplatelets, anticoagulants, oxygen, nitroglycerin, morphine, reperfusion therapy.
- **Stabilization:** Beta-blockers, ACE inhibitors, statins, diuretics (for pulmonary congestion).
- **Long-term:** Lifestyle modification, cardiac rehabilitation, strict adherence to medications, and risk factor management (smoking cessation, BP control, diet).

2. Nursing Interventions

Immediate Interventions
- Oxygen therapy via nasal cannula (4 L/min).
- Continuous cardiac monitoring.
- Administration of aspirin, nitroglycerin, and morphine as per physician's orders.
- Establishing IV access and preparing for thrombolytic therapy.

Ongoing Nursing Care
- Hourly monitoring of vital signs, urine output, and ECG changes.
- Bed rest to reduce myocardial oxygen demand.
- Emotional support and reassurance to patient and family.
- Education on medication adherence: antiplatelets, beta-blockers, ACE inhibitors, and statins.

Health Education and Lifestyle Modification
- Strict advice for smoking cessation.
- Low-fat, low-sodium cardiac diet.
- Gradual resumption of physical activity post-recovery.
- Regular follow-up and participation in cardiac rehabilitation programs.

Outcome
Following thrombolytic therapy and intensive nursing care, the patient's chest pain resolved, ECG changes improved, and oxygen saturation stabilized at 96%. The patient was discharged on the sixth day with advice for strict lifestyle modification, prescribed cardiac medications, and scheduled follow-up visits.

3. Discussion

This case illustrates the classic clinical features of inferior wall myocardial infarction and emphasizes the importance of early diagnosis and intervention. Nursing care played a vital role in stabilizing the patient, preventing complications, and ensuring long-term adherence to treatment plans. Evidence suggests that prompt reperfusion therapy combined with continuous nursing support reduces morbidity and improves survival in MI patients (Ibanez et al., 2018; O'Gara et al., 2013).

Patient education regarding risk factor modification is equally important. Smoking cessation, dietary modification, and compliance with pharmacological therapy are proven to reduce the risk of recurrent coronary events (Benjamin et al., 2019). Nurses, through holistic and patient-centered care, significantly contribute to recovery and secondary prevention.

4. Conclusion

Myocardial infarction is a critical cardiovascular emergency that demands immediate recognition, multidisciplinary intervention, and continuous nursing care. This case report highlights the essential role of nurses in acute management,

psychosocial support, and long-term prevention of complications. Strengthening patient education and lifestyle modifications is crucial in reducing the recurrence of myocardial infarction and improving quality of life.

References

[1] Benjamin, E. J., Muntner, P., Alonso, A., et al. (2019). Heart disease and stroke statistics—2019 update. *Circulation, 139*(10), e56–e528.
[2] Ibanez, B., James, S., Agewall, S., et al. (2018). 2017 ESC Guidelines for the management of acute myocardial infarction. *European Heart Journal, 39*(2), 119–177.
[3] O'Gara, P. T., Kushner, F. G., Ascheim, D. D., et al. (2013). 2013 ACCF/AHA guidelines for the management of ST-elevation myocardial infarction. *Circulation, 127*(4), e362–e425.
[4] Roffi, M., Patrono, C., Collet, J. P., et al. (2016). 2015 ESC Guidelines for acute coronary syndromes. *European Heart Journal, 37*(3), 267–315.
[5] Smith, J., Brown, L., & Taylor, P. (2022). Evidence-based nursing care in acute coronary syndrome. *Journal of Cardiovascular Nursing, 37*(4), 210–218.
[6] Thygesen, K., Alpert, J. S., Jaffe, A. S., et al. (2018). Fourth universal definition of myocardial infarction. *Journal of the American College of Cardiology, 72*(18), 2231–2264.
[7] World Health Organization. (2023). Cardiovascular diseases (CVDs). https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)
[8] Yancy, C. W., Jessup, M., Bozkurt, B., et al. (2017). 2017 ACC/AHA/HFSA heart failure guideline. *Circulation, 136*(6), e137–e161.
[9] Kumar, P., & Clark, M. (2020). *Kumar and Clark's Clinical Medicine* (10th ed.). Elsevier.
[10] Lewis, S. L., Bucher, L., Heitkemper, M. M., Harding, M. M., & Kwong, J. (2020). *Medical-Surgical Nursing: Assessment and Management of Clinical Problems* (11th ed.). Elsevier.