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Nursing Experience in a Case of Intravenous Thrombolysis for Acute Myocardial Infarction: Postprint

Authors: Li Han, Han Jianping, Li Ying, Ren Yaxing, Cao Wenjie, Li Shuyue, YANG Yuwei, Wang Jing

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Abstract

This article summarizes a case of nursing interventions targeting severe myocardial ischemia pain in a patient with acute myocardial infarction undergoing intravenous thrombolysis during treatment, aiming to improve patient satisfaction. Cardiac rehabilitation nursing was implemented to alleviate excessive reactions during treatment, thereby enhancing therapeutic efficacy. This paper reviews the emergency measures and nursing approaches for one case of acute myocardial infarction and summarizes the relevant nursing insights.

Full Text

Preamble

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Title

Nursing Experience of Emergency PCI After Intravenous Thrombolysis in a Case of Acute Myocardial Infarction

Authors

Li Han, Han Jianping, Li Ying, Ren Yaxing, Cao Wenjie, Li Shuyue, Yang Yuwei, Wang Jing
(Department of Emergency, Dongfang Hospital, Beijing University of Chinese Medicine, Beijing 100078, China)

Abstract

This article summarizes the nursing interventions implemented for a patient with acute myocardial infarction (AMI) who underwent emergency percutaneous coronary intervention (PCI) following intravenous thrombolysis. During treatment, targeted nursing interventions were administered for severe myocardial ischemic pain to enhance patient comfort and satisfaction. Cardiac rehabilitation nursing care was implemented to alleviate adverse reactions during treatment and improve therapeutic outcomes. We review the emergency measures and nursing approaches employed for this AMI patient and summarize the relevant nursing experience.

Keywords: acute myocardial infarction; severe pain; cardiac rehabilitation; nursing

Introduction

Acute myocardial infarction (AMI) is an ischemic necrosis of the myocardium resulting from coronary artery obstruction and insufficient blood supply. Clinically, AMI typically manifests as severe and persistent retrosternal pain that cannot be fully relieved by rest or nitrate administration, accompanied by elevated serum cardiac enzymes, dynamic electrocardiographic changes, and potential complications including arrhythmia, cardiogenic shock, or heart failure that may endanger life [1]. Most AMI patients experience intense crushing precordial pain that is difficult to tolerate, and nearly all develop fear and extreme mental tension, even agitation. This triggers sympathetic excitation, accelerates heart rate, increases myocardial oxygen consumption, and further exacerbates myocardial ischemia and hypoxia, often complicating rescue efforts. Therefore, once diagnosis is established, every minute counts and comprehensive rescue efforts must be implemented, with excellent emergency measures and nursing care being critically important [2]. This article reviews one AMI patient admitted to our department who received emergency PCI after intravenous thrombolysis, with satisfactory results. The nursing experience is summarized below.

Case Presentation

Clinical Data

The patient was a 25-year-old male who presented with the following complaint: Twelve hours prior, he developed chest pain lasting several minutes that resolved spontaneously. He did not seek attention or take medication. Two hours prior to admission, he experienced recurrent chest pain that persisted without relief, accompanied by sweating, chest tightness, and breathlessness. He denied dizziness, headache, hematemesis, abdominal pain, diarrhea, shoulder or back pain, low back pain, or limb movement difficulties. He took no medication and came to our emergency department with a colleague.

Admission physical examination revealed: temperature 36.6°C, heart rate 101

beats/min, respiratory rate 18 breaths/min, blood pressure 128/64 mmHg, SpO₂ 99%. The patient was conscious but agitated, with equal-sized pupils and present light reflexes. Lung auscultation showed clear breath sounds without obvious moist or dry rales. No pathological murmurs were heard at any cardiac valve. The abdomen was flat and soft without tenderness or rebound tenderness. Murphy's sign was negative, McBurney's point was non-tender, and bowel sounds were normal.

Laboratory and Auxiliary Examinations

Laboratory tests demonstrated: CK 284.0 U/L, CK-MB 16 U/L, TnT 0.05 g/L, TnI 0.16 ng/mL, K 4.18 mmol/L, GLU 10.38 mmol/L, pH 7.498. Electrocardiogram monitoring showed sinus rhythm with regular rhythm, and leads V2 through V5 exhibited ST-segment elevation diagnostic of acute myocardial infarction (see Figure 1 [Figure 1: see original paper]-1).

Treatment Plan

The treatment plan consisted of: (1) Immediate admission to the emergency intensive care unit with cardiac monitoring, continuous low-flow oxygen via bilateral nasal cannula, critical condition notification, first-level medical nursing care, and cardiology second-line consultation. (2) Immediate intravenous thrombolysis with alteplase 75 mg via pump, oral aspirin 300 mg, ticagrelor 180 mg, and subcutaneous morphine injection 5 mg for pain relief. Following family consent, the patient was transferred to the catheterization laboratory for emergency PCI of the anterior descending artery. The procedure was successful (see Figure 1-2). The patient was subsequently transferred to the coronary care unit (CCU) for continued treatment.

Outcome

The patient's condition improved and he was discharged on August 12, 2022.

Nursing Care

Routine Nursing Care

Oxygen therapy was administered with continuous low-flow oxygen, representing one of the most fundamental measures in AMI treatment. The principle involves increasing alveolar oxygen partial pressure through oxygen inhalation to ensure tissue oxygen supply, thereby alleviating tissue hypoxia and improving myocardial oxygenation. Oxygen therapy increases oxygen supply to ischemic myocardium surrounding the infarction, prevents further myocardial cell necrosis, and slows hypoxic myocardial injury [3]. Bed rest was strictly enforced for 1-3 days after onset, with nurses assisting all activities including eating, toileting, washing, and turning. We explained to the patient and family that absolute bed rest aims to reduce myocardial oxygen consumption and cardiac

load, with activity gradually increasing as the condition improved. Dietary management involved small, frequent meals with low-fat, easily digestible, low-calorie semi-liquid or liquid foods, primarily light foods, avoiding irritants, and appropriately increasing vegetables and fruits [4]. Health education was provided to the patient and family with caring language and behavior, offering psychological comfort and explaining that pain is related to myocardial hypoxia and ischemia to reduce emotional fluctuations [5]. This alleviated psychological pressure from disease unfamiliarity, regulated pre-operative tension and discomfort, and mitigated excessive reactions during AMI interventional treatment. Preventing negative emotions such as anxiety and depression improved surgical outcomes [6]. Postoperative guidance included cardiac rehabilitation education on rehabilitation assessment, exercise training, healthy lifestyle habits, regular medication adherence, and regular monitoring of various indicators [7].

Pain Nursing Care

Pain stimulation induces stress responses that increase myocardial oxygen consumption and expand the infarct area [8]. During treatment, nurses must enhance communication, address psychological needs, and provide targeted psychological counseling while implementing pain interventions [9]. We assessed the patient's pain status using the Numeric Rating Scale (NRS) for pain (see Figure 2 [Figure 2: see original paper]-1). The NRS categorizes pain as none (0 points), mild (1-3 points: pain during turning, coughing, or deep breathing), moderate (4-6 points: pain at rest affecting sleep), or severe (7-10 points: restless turning, inability to sleep, profuse sweating, unbearable). This patient experienced persistent, unbearable pain with profuse sweating, scoring 8 points on the NRS, indicating severe pain. Morphine injection 5 mg was administered subcutaneously as prescribed. Morphine has respiratory depressive effects, requiring continuous close monitoring of patient condition, respiratory frequency, rhythm, and depth with continuous cardiac monitoring to prevent circulatory and respiratory depression or death [10]. Treatment efficacy was observed, and the patient's pain improved after 8 minutes, with a repeat pain score of 6 points. We informed the patient that absolute bed rest could reduce myocardial oxygen consumption and sympathetic excitation, which helps relieve pain, and obtained cooperation to eliminate patient anxiety [11].

Thrombolysis Nursing Care

Before thrombolysis therapy, intravenous catheters were placed to ensure immediate venous access for early drug administration, improving rescue success rates and facilitating thrombolytic medication and emergency rescue, thus establishing a "green channel" for critically ill patients. Therefore, two intravenous catheters were generally placed before thrombolysis for emergency use [12]. Patients were informed about the duration of thrombolysis and precautions, assisted to a supine position, and preemptively informed about potential adverse reactions such as nasal or oral mucosal bleeding to avoid affecting psychological

status. If patients exhibited reluctance, the necessity of thrombolysis for treatment was explained and positive post-treatment outcomes were discussed [13]. During thrombolysis, medications were prepared and administered strictly according to medical orders while closely monitoring heart rate changes, ensuring patent venous access, and preventing fluid extravasation. ST-segment evolution and pain relief after medication were observed, and any chest pain phenomena were promptly recorded while providing emotional support [14]. After thrombolysis, comprehensive examination of the oral cavity, nasal cavity, puncture sites, and other bleeding points was performed, and patients were asked about chest pain relief with continuous documentation to avoid increasing treatment risks and ensure nursing quality.

Discussion

Acute myocardial infarction is a life-threatening emergency. With improving living standards, its incidence is gradually increasing. Due to its sudden onset, rapid progression, and high sudden death rate, rapid and accurate diagnosis, close observation of condition changes, timely treatment, and meticulous nursing care are key to improving cure rates and reducing mortality [15]. This patient with ST-segment elevation myocardial infarction was successfully rescued through timely medication and nursing care. Close observation of condition changes, accurate and effective recording of intake and output, effective rehabilitation nursing, and psychological care, along with proficient mastery of emergency techniques to promptly inform physicians of condition changes and cooperate in rescue efforts, effectively ensured patient safety.

In summary, when admitting AMI patients, timely and effective emergency measures can reduce mortality to a certain extent while decreasing various complications and improving clinical treatment outcomes [16]. Whether in-hospital or out-of-hospital rehabilitation, and regardless of medication compliance levels or successful implementation of core prescriptions, health education is indispensable, making it an important nursing component throughout cardiac rehabilitation [17]. Early, effective, and timely emergency care and nursing are significant for improving patient survival rates [18].

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