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# Exploration of Multimedia Cases Combined with PBL Teaching Method in Teaching Myocardial Infarction

Xiaoqing Ning

Tianjin Medical University

**Abstract:** The clinical manifestations of myocardial infarction (MI) are diverse, the differential diagnosis is complex, and involves multiple systems. The teaching profession is strong, and actively exploring effective teaching methods is crucial for the training of cardiovascular clinical physicians. The multimedia case teaching method uses various technologies such as audio and video to visually and vividly present cases, combined with a problem oriented (PBL) teaching method, which can fully mobilize students' subjective initiative, stimulate their interest in acquiring knowledge, induce students to tap their own potential, help students better grasp the pathogenesis, diagnostic principles, differential diagnosis methods, and treatment principles of MI, promote quality education, and improve teaching quality.

**Keywords:** multimedia; PBL teaching; miocardial infarction

Myocardial infarction (MI) has a high incidence rate and mortality, and its rapid and accurate diagnosis and treatment are essential to reduce the mortality of MI patients. The MI teaching has strong professionalism, involves a wide range of knowledge, complex differential diagnosis, and involves multiple systems, which requires high practical abilities from students. Therefore, actively exploring effective teaching methods to enable students to solidly grasp this part of the content and become qualified clinical doctors in cardiovascular medicine is the key to current teaching. The multimedia case teaching method is different from the dull and rigid presentation of teaching cases in the past, but is a method of presenting cases in a vivid and intuitive way using various technologies such as audio and video. On this basis, combining problem based learning (PBL) teaching methods can stimulate students' interest in acquiring knowledge, make them the center of the classroom, induce students to explore their own potential, help students better understand the pathogenesis of MI, and combine clinical real cases to help students master the diagnostic points, differential diagnosis principles, and comprehensive treatment methods of MI, effectively improving the quality of medical undergraduate education.

## 1. Problems in Traditional MI Teaching

Traditional MI teaching mainly focuses on teachers imparting theoretical knowledge. In etiology teaching, high-risk factors for MI include "three highs", namely hypertension, hyperglycemia, and hyperlipidemia. In addition, smoking is also an independent risk factor for MI. Excessive fatigue, satiety, cold stimulation and emotional excitement are often the inducements of MI. Under the stimulation of these factors, acute thrombosis in the coronary artery, based on the original coronary atherosclerosis, leads to partial myocardial necrosis. In the teaching of diagnosis and differential diagnosis, a preliminary diagnosis of MI can be made based on the location, nature, duration of chest pain onset, as well as the inducing and relieving factors of chest pain, whether there is scattered pain, the location of scattered pain, and other detailed medical history. In addition, the typical electrocardiogram manifestations, myocardial injury markers, and cardiac ultrasound during the occurrence of MI also contribute to the diagnosis. Given the different infarct related blood vessels, the manifestations of MI also vary, which undoubtedly increases the difficulty of diagnosis. Acute anterior wall myocardial infarction caused by blockage of the left anterior descending

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coronary artery often presents with severe precordial or retrosternal pain accompanied by a sense of impending death. The main symptoms of inferior wall MI caused by right coronary artery occlusion in patients may be severe upper abdominal pain, accompanied by nausea and vomiting. It is necessary to quickly and accurately distinguish it from acute abdomen. In the treatment teaching of MI, it is necessary to monitor the patient's vital signs in a timely manner, and provide treatment such as anticoagulation, antiplatelet therapy, lipid-lowering therapy, and reducing myocardial oxygen consumption. Hospitals that are eligible for percutaneous coronary intervention (PCI) should promptly perform PCI, open blood vessels as soon as possible, and save the patient's life.

## **2. The advantages of combining multimedia cases with PBL teaching in MI teaching**

Cultivate students' clinical thinking ability and improve their efficiency in mastering knowledge. PBL teaching method was first proposed by American neurology professor Barrows in 1969 and has become a popular teaching method internationally. In PBL teaching method, students are in a dominant position and teachers are in a guiding position. Only by combining the two organically can the advantages of PBL teaching be fully utilized, students' potential be tapped, and their innovative spirit and practical application ability be cultivated. The MI part of the knowledge is complex and intricate, making it the backbone course of coronary heart disease. A strong interest in learning can help students master this knowledge. The PBL teaching model takes case studies as the guide and aims to cultivate high-quality medical talents. At present, many medical schools use multimedia case studies for teaching. Due to the fact that multimedia cases include vivid and vivid case data, they have greater advantages than traditional teaching methods. Both PBL teaching and multimedia case teaching methods rely on the support of computer multimedia networks. Teaching practice has shown that multimedia teaching can significantly improve teaching efficiency. For example, in the teaching of acute anterior wall MI, teachers can display electrocardiograms of patients in the hyperacute, acute, and chronic phases, helping students understand the dynamic evolution of memory electrocardiograms and locate diagnostic methods. The dynamic image of echocardiography can observe a significant decrease in the amplitude of the left ventricular anterior wall, and the dynamic observation of myocardial enzyme spectrum can reveal the peak time of myocardial enzyme release. Coronary CT angiography or direct coronary angiography can visually display important information such as the location of blockage in the left anterior descending coronary artery, thrombus load, lesion length, and vessel diameter. Some patients may develop valve diseases or severe mechanical complications of MI, and corresponding pathological murmurs can be heard through physical examination. This information is crucial for helping students make correct diagnosis and differential diagnosis.

In summary, both traditional teaching methods and multimedia case based PBL teaching methods aim to maximize the quality of teaching. In traditional teaching methods, students mainly rely on their teachers to acquire knowledge, resulting in low efficiency in mastering knowledge. Therefore, in response to the complex pathogenesis, diverse clinical manifestations, and difficult differential diagnosis of acute myocardial infarction, the use of multimedia case studies combined with PBL teaching can fully leverage its teaching advantages, cultivate students' clinical thinking ability, improve their efficiency in mastering knowledge, stimulate their interest in actively acquiring knowledge, and exercise their communication skills.

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