

Analysis of Factors Affecting Long-Term Prognosis After Emergency Pci in Patients with Acute Myocardial Infarction

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ABSTRACT

The aim of this study is to comprehensively and deeply investigate the relevant factors affecting the long-term prognosis of patients with acute myocardial infarction after emergency PCI by systematically analyzing their clinical data. It is of great clinical significance to study the factors affecting the long-term prognosis of acute myocardial infarction patients after emergency PCI. In terms of clinical treatment, by clarifying the factors affecting prognosis, doctors are able to identify high-risk patients at an early stage and formulate more precise and personalized treatment plans for them. This helps to improve the treatment effect, improve the long-term prognosis of patients, and reduce the waste of medical resources.

KEYWORDS

Acute myocardial infarction; PCI; Postoperative long-term prognosis; Influencing factors

1 Theoretical analysis of influencing factors

1.1 Basic patient characteristics

1.1.1 Age

Age is one of the important factors affecting the long-term prognosis of acute myocardial infarction patients after emergency PCI (Percutaneous Coronary Intervention). With age, the body's physiological functions gradually decline, and the cardiovascular system is no exception.

1.1.2 Gender difference

Gender also shows some differences in the prognosis of patients with acute myocardial infarction after emergency PCI. There are significant differences between men and women in terms of physiological structure and hormone levels, and these differences play an important role in the impact on the cardiovascular system and in the recovery process after the procedure.

1.2 Underlying diseases and lifestyle habits

1.2.1 Impact of diseases such as diabetes, hypertension and hyperlipidemia

Diabetes mellitus, a common metabolic disease, has a significant impact on the prognosis of patients with acute myocardial infarction after emergency PCI. Hypertension is another important underlying disease that damages the cardiovascular system in multiple ways. Hyperlipidemia, which is mainly characterized by elevated serum levels of cholesterol, triglycerides, and LDL cholesterol, as well as decreased levels of HDL cholesterol, is an important risk factor for atherosclerosis.

1.2.2 Smoking, drinking and other bad habits

Smoking is a bad habit that is extremely harmful to the cardiovascular system, and its negative impact on the prognosis of acute myocardial infarction patients after emergency PCI cannot be ignored. Cigarettes contain a variety of harmful substances, such as nicotine, tar, and carbon monoxide, which, after entering the human body, can trigger a series of physiopathologic changes and increase the risk of postoperative cardiovascular events. Moderate alcohol consumption may have some benefits for the cardiovascular system, such as elevating HDL cholesterol levels and having some antioxidant and anti-inflammatory effects. However, prolonged heavy drinking can have serious negative effects on cardiac function and increase the risk of cardiovascular events after emergency PCI in patients with acute myocardial infarction.

1.3 Surgery-related factors

1.3.1 Revascularization time

Revascularization time is one of the key surgical correlates affecting the long-term prognosis after emergency PCI in patients with acute myocardial infarction. When acute myocardial infarction occurs, acute occlusion of the coronary artery

leads to myocardial ischemia and hypoxia, and irreversible damage to cardiomyocytes begins to occur. The shorter the time interval from onset to revascularization, the shorter the ischemic time of the myocardium, and the more dying myocardium that can be saved, thus effectively reducing the area of myocardial infarction, lowering the risk of heart failure, arrhythmia, and other complications, and improving the long-term prognosis of patients.

1.3.2 Quality of surgical operations

The quality of surgical operation has a crucial impact on vascular patency and patient prognosis after emergency PCI in patients with acute myocardial infarction. Improper surgical operation may cause a variety of problems, such as vascular injury and poor stent implantation position, which will directly affect the surgical outcome and increase the risk of postoperative cardiovascular events.

In order to improve the quality of surgical operations and reduce the occurrence of surgery-related complications, physicians need to possess rich clinical experience and excellent surgical skills. By improving the quality of surgical operations, the risk of postoperative cardiovascular events can be effectively reduced and the long-term prognosis of patients can be improved.

1.4 Post-operative rehabilitation and treatment

1.4.1 Medication adherence

Pharmacotherapy occupies a central position in the treatment of acute myocardial infarction patients after emergency PCI and is a key means of preventing thrombosis, controlling blood pressure and blood lipids, and maintaining the stability of the cardiovascular system. Taking medication on time and in accordance with dosage is crucial for patient recovery, and it can effectively reduce the risk of cardiovascular events and improve the long-term prognosis of patients.

However, in actual clinical practice, patients' medication adherence is generally low, which seriously affects the treatment effect and prognosis. In order to improve patients' adherence to drug therapy, healthcare professionals should strengthen health education for patients and improve their knowledge of diseases and drug therapy.

1.4.2 Rehabilitation sports and psychological interventions

Rehabilitation exercises and psychological interventions play an indispensable role in the rehabilitation process of acute myocardial infarction patients after emergency PCI, and they can effectively promote the physical recovery of patients, improve the quality of life, and improve the long-term prognosis. Rehabilitation exercise has a significant positive effect on the recovery of cardiac function in patients with acute myocardial infarction. Through long-term adherence to rehabilitation exercises, patients' cardiopulmonary function is enhanced, their physical endurance and mobility are improved, and they can better adapt to daily life and work.

2 Research design and methodology

2.1 Selection of Study Subjects and Design Ideas

A total of 100 eligible patients with acute myocardial infarction who were seen in our cardiology department and treated with emergency PCI from June 2023 to June 2024 were included in this study.

In this study, the method of controlled experiment was adopted, and in the experimental grouping, patients with acute myocardial infarction who met the inclusion criteria were randomly divided into the experimental group and the control group. Patients in both the experimental and control groups received standardized emergency PCI treatment and routine postoperative drug therapy, including antiplatelet aggregation, anticoagulation, lipid regulation, antihypertensive and other drugs. The difference is that patients in the experimental group received more comprehensive and personalized integrated management measures after surgery. Patients in the control group received only routine postoperative care and follow-up visits. Through this control method, the impact of comprehensive management measures on the long-term prognosis of patients can be clarified.

2.2 Data collection methods

The data collection of this study was mainly carried out through the pathway of medical record review, and the researchers reviewed the hospitalized medical records of the enrolled patients in detail from the hospital's electronic medical record system. The basic information of the patients was recorded in detail, including name, gender, age, contact information, occupation, etc.; as well as the disease history of the patients, such as the duration of illness and treatment of chronic diseases such as hypertension, diabetes, hyperlipidemia, and so on.

2.3 Data analysis methods

In this study, SPSS 26.0 statistical software was used to analyze the data to ensure the accuracy and reliability of the

results.

Count data were expressed using the number of cases (n) and percentage (%), and the χ^2 test was used for comparison between groups. When studying the patients' count data such as gender distribution, smoking history, and history of hypertension, the χ^2 test was used to analyze whether there was a significant difference between the two groups in the composition ratio of these factors, and then to explore the relationship between these factors and the patients' prognosis. When the theoretical frequency was less than 5, the continuous corrected χ^2 test or Fisher's exact probability method was used for the analysis to ensure the accuracy of the statistical results.

3 Findings

In this study, several typically representative influencing factors were selected and statistically analyzed as follows:

3.1 Impact of age factors on prognosis

Age is one of the important factors affecting the long-term prognosis of acute myocardial infarction patients after emergency PCI. In this study, patients were divided into ≤ 60 years old group, 61-75 years old group and > 75 years old group according to their age, comparing the prognosis of patients in different age groups, and analyzing the relationship between age and the incidence of prognostic adverse events. The specific data are shown in Table 1

Table 1 Comparison of the incidence of prognostic adverse events in patients of different age groups

Age Group	Examples	Recurrent myocardial infarction(n,%)	Heart failure(n,%)	Cardiac Dysrhythmia (n,%)	Incidence of total adverse events(n,%)
≤ 60 -year-old group	35	7(20%)	5(14.28%)	3(8.57%)	15(42.85%)
61-75-year-old group	35	5(14.28%)	10(28.57%)	5(14.28%)	20(57.14%)
> 75 -year-old group	30	10(33.33%)	10(33.33%)	5(16.66%)	25(83.33%)

The difference in the total adverse event rates of patients in different age groups was statistically significant by χ^2 test ($P < 0.05$). Further two-by-two comparisons revealed that the adverse event rates of recurrent myocardial infarction, heart failure, and arrhythmia in patients in the > 75 -year-old group were significantly higher than those in the ≤ 60 -year-old group and in the 61-75-year-old group ($P < 0.05$). The adverse event rates of patients in the 61-75-year-old group were also higher than those in the ≤ 60 -year-old group, but some of the differences were not statistically significant ($P > 0.05$). In summary, age is an important factor affecting the long-term prognosis of acute myocardial infarction patients after emergency PCI, and the older the patient, the higher the risk of adverse cardiovascular events after surgery and the worse the long-term prognosis. In clinical treatment, more attention and individualized treatment should be given to elderly patients, postoperative management and follow-up should be strengthened, and risk factors should be actively controlled to improve patients' prognosis.

3.2 Impact of underlying disease (e.g., diabetes, hypertension, etc.) on prognosis

Underlying diseases play an important role in the long-term prognosis of acute myocardial infarction patients after emergency PCI. In this study, we analyzed in depth the prognostic differences between patients with comorbid underlying diseases such as diabetes mellitus and hypertension and those without underlying diseases in order to reveal the mechanism of the influence of underlying diseases on prognosis. The relevant data statistics are shown in Table 2:

Table 2 Comparison of the rates of prognostic adverse events in patients with and without comorbid underlying diseases

Basic diseases	Examples	Recurrent myocardial infarction(n,%)	Heart failure(n,%)	Cardiac Dysrhythmia (n,%)	Incidence of total adverse events(n,%)
Diabetes (Yes/No)	55/45	(12,21.81%)/(10,22.22%)	(15,36.36%)/(10,22.22%)	(13,23.63%)/(10,22.22%)	(40,72.72%)/(30,66.66%)
High blood pressure (with/without)	60/40	(18,30%)/(10,25%)	(20,33.33%)/(10,25%)	(17,28.33%)/(10,25%)	(55,91.66%)/(30,75%)
Hyperlipidemia (Yes/No)	53/47	(16,30.18%)/(12,25.53%)	(14,26.41%)/(12,25.53%)	(15,28.3%)/(11,23.4%)	(45,84.9%)/(35,74.46%)

By χ^2 test, the total incidence of adverse events such as recurrent myocardial infarction, heart failure, and arrhythmia was significantly higher in patients with combined diabetes than in patients without diabetes ($P < 0.05$); the total incidence of adverse events was also higher in patients with combined hypertension than in patients without hypertension, and the difference was statistically significant ($P < 0.05$); and the incidence of adverse events was similarly higher in patients with hyperlipidemia, and the difference was statistically significant ($P < 0.05$) when compared with patients without hyperlipidemia, and the difference was statistically significant ($P < 0.05$).

In summary, underlying diseases such as diabetes mellitus, hypertension, and hyperlipidemia are closely related to the long-term prognosis of acute myocardial infarction patients after emergency PCI, and the risk of adverse cardiovascular events after surgery is significantly increased in patients with a combination of these underlying diseases. In clinical treatment, great attention should be paid to the management and control of underlying diseases, and effective therapeutic measures should be actively taken, such as controlling the levels of blood glucose, blood pressure, and blood lipids, and improving metabolic disorders, in order to reduce the incidence of adverse events and improve the long-term prognosis of patients.

3.3 Prognostic impact of postoperative medications (e.g., antiplatelet agents, statins, etc.)

Postoperative drug use plays a pivotal role in the long-term prognosis of acute myocardial infarction patients after emergency PCI. In this study, the postoperative use of antiplatelet drugs and statins was analyzed in detail to explore in depth the relationship between different medication regimens and patients' prognosis, and the relevant statistics are shown in Table 3:

Table 3 Comparison of the incidence of prognostic adverse events in patients with different postoperative medication regimens

Medication regimen	Examples	Recurrent myocar-		Cardiac Dysrhyth-	Incidence of total ad-
		dial infarction (n,%)	Heart failure(n,%)	mia(n,%)	verse events(n,%)
Antiplatelet drug (standard use /not standard use)	50/50	(5,10%)/(9,18%)	(10,20%)/(12,24%)	(5,10%)/(9,18%)	(20,40%)/(30,60%)
Statins (prescribed/not prescribed)	50/50	(5,10%)/(10,20%)	(5,10%)/(15,30%)	(5,10%)/(10,20%)	(15,30%)/(35,70%)

By χ^2 test, the total incidence of adverse events such as recurrent myocardial infarction, heart failure, arrhythmia, and cardiac death in patients who were standardized on antiplatelet drugs was significantly lower than in those who were not standardized ($P < 0.05$). In terms of statin use, the total incidence of adverse events in patients taking statins in a standardized manner was significantly lower than in those who did not take them in a standardized manner, and the difference was statistically significant ($P < 0.05$).

In summary, standardized postoperative administration of antiplatelet drugs and statins is closely related to the long-term prognosis of acute myocardial infarction patients after emergency PCI. Standardized drug therapy can effectively reduce the incidence of postoperative adverse cardiovascular events and improve the prognosis of patients. In clinical practice, doctors should strengthen medication guidance for patients, improve patients' medication compliance, and ensure that patients can take postoperative medications in a standardized manner to maximize the therapeutic effects of medications and improve patients' long-term prognosis.

4 Conclude

In this study, we systematically analyzed the clinical data of 100 patients with acute myocardial infarction after emergency PCI and comprehensively investigated the relevant factors affecting their long-term prognosis. The results of the study showed that age, underlying disease, and postoperative medication were independent risk factors affecting the long-term prognosis of acute myocardial infarction patients after emergency PCI. This study also found that smoking, alcohol consumption, hypertension, hyperlipidemia and other factors interacted with each other and jointly influenced the prognosis of patients. In clinical practice, it is still necessary to pay sufficient attention to these factors and take appropriate interventions, such as smoking cessation and alcohol restriction and blood pressure and lipid control, in order to reduce the risk of cardiovascular events and improve the prognosis of patients.

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