



Advances in the Clinical Management of Acute Myocardial Infarction

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Abstract: Acute myocardial infarction is a kind of cardiovascular disease mainly caused by coronary artery stenosis, atherosclerosis or blockage of myocardial cell hypoxia and ischemic necrosis, and it is one of the most hazardous cardiovascular diseases around the world. In recent years, the incidence of acute myocardial infarction has been increasing year by year in our country as well as the trend of rejuvenation, which has aroused the great importance of various medical experts. This has also caused various medical experts to pay great attention to the treatment of acute myocardial infarction in the clinic through the treatment of acute myocardial infarction to carry out continuous in-depth exploration, summarized some of the treatment of acute myocardial infarction effective methods. In this paper, the causes of acute myocardial infarction are elaborated, and the treatment plan of acute myocardial infarction is summarized, hoping to provide certain reference for clinical research.

Keywords: acute myocardial infarction, clinical management, therapeutic program

1. Introduction

Acute myocardial infarction is a more serious clinical cardiovascular disease, When the disease occurs, the patient will have persistent chest pain phenomenon, and accompanied by severe arrhythmia, heart failure, cardiogenic shock symptoms, is a relatively high clinical mortality rate of the disease, the current clinical treatment for this disease is to restore the patient's cardiac blood circulation, to prevent the infarction area from further expanding, so as to restore the blood supply to the cardiac myocytes. blood supply to the myocardial cells.

2. Causes of acute myocardial infarction

2.1 Overexertion

After strenuous exercise, heavy physical labor and high-intensity work, it will lead to a gradual increase in the patient's myocardial load, the speed of blood circulation becomes faster, so that myocardial cell oxygen consumption increases, so that the patient's coronary arteries are unable to withstand this pressure, the phenomenon of myocardial infarction occurs[1].

2.2 Mood swings

The patient's relatively large emotional fluctuations, such as anger, excitement, and nervousness can cause the body to experience a stress response that can lead to the appearance of the disease.

2.3 Dietary changes

Patients in the life of long-term consumption of high-calorie, high protein food, will make the blood lipid abnormal, increase the viscosity of the blood, make the platelet aggregation triggered by atherosclerosis of coronary arteries, blood vessel lumen gradually narrowing induced disease.

2.4 Sharp changes in temperature

A sudden drop in temperature stimulated by cold makes the patient's coronary heart disease attack, further inducing the occurrence of acute myocardial infarction[2].

2.5 Constipation

When the patient after the constipation, in the process of defecation, need to force, so that the brain blood supply is insufficient, so that the cardiomyocytes for the brain to provide blood workload increases, in the long run will lead to myocardial infarction, the occurrence of.

2.6 Smoking and Alcohol

Chronic alcohol and cigarette smoking greatly increases the risk of acute myocardial infarction by increasing coronary artery spasm and myocardial oxygen consumption[3].

3. Treatment of acute myocardial infarction

3.1 Surgical treatment

3.1.1 Percutaneous coronary intervention

Percutaneous coronary intervention is the main treatment for acute myocardial infarction, especially acute ST-segment elevation myocardial infarction, in which a balloon catheter is delivered through puncture to dilate the stenotic coronary arteries of the patient, and then a stent is delivered to further alleviate the symptoms of stenosis and blockage of the coronary arteries of the patient, and effectively restore the blood perfusion of the cardiac myocytes. This procedure is highly effective. This procedure is highly effective and less damaging to the patient.

In a study by Ding Yanling[4] et al, it was found that direct percutaneous coronary artery surgery for myocardial infarction can further improve the blood supply of the patients and promote the recovery of heart functions, which is better than elective surgery, and can further prevent recurrent attacks and improve the prognosis of the patients. However, Zou Huawei[5] et al. have a different view on this surgical treatment. In their study, patients with non-ST-segment elevation myocardial infarction were treated with elective surgery, and the results showed that the efficacy of this treatment was more significant in the recovery of cardiac function than that of the patients who were directly operated on and that the chances of adverse cardiovascular function were lower after the surgery. The results show that this treatment is more effective in restoring cardiac function and less likely to cause adverse effects on cardiovascular function after surgery than direct surgery.

According to the experimental research of many experts at home and abroad, for ST-segment elevation myocardial infarction patients are more recommended to take direct percutaneous coronary intervention for treatment, and under the condition of the circumstances permitting the placement of stents, while for non-ST-segment elevation myocardial infarction patients are more recommended to use elective surgery for treatment. Clinical research data show[6] that after treatment with percutaneous coronary intervention, about 47% of patients will have depression, anxiety and other negative emotions, and these negative emotions often induce patients to develop a variety of cardiovascular diseases, which may easily lead to recurrence of myocardial infarction symptoms and increase the mortality rate of the disease. Therefore, clinical experts said that after the treatment of this part of the patients, it is necessary to actively carry out the postoperative psychological counseling, so as to avoid the patients' bad mood on the adverse effects of the disease.

3.1.2 Coronary artery bypass grafting

Coronary artery bypass grafting, also known as coronary artery bypass grafting in clinical practice[7], is a commonly used treatment for acute myocardial infarction, and is divided into two main categories: extracorporeal circulation and non-corporeal circulation. Clinical researchers at[8] have found, through the use of experimental methods of coronary artery bypass grafting with extracorporeal circulation and coronary artery bypass grafting with non-extracorporeal circulation, that patients recover better from the former, but that there is a high-risk reaction during the process of treatment. For example, various inflammatory reactions produced by the body after the operation will damage the patient's health, inducing respiratory insufficiency, necrosis of cardiomyocytes, arrhythmia and other complications, while the use of non-corporeal coronary artery bypass grafting technology can further ensure that to enhance the clinical efficacy of the patients at the same time greatly reduce the postoperative complications, so that the patients can be able to recover as soon as possible.

Li Jing[9] et al. found that 85% of patients treated with non-corporeal coronary artery bypass grafting had myocardial ischemia/reperfusion injury, 65% had transient hypotension, 72% had arrhythmia, and 29% had abnormal ST-segment changes on the electrocardiogram after the surgery. The results also demonstrate that the use of non-extracorporeal circulation has significant advantages over extracorporeal techniques, but that complications can easily arise after the procedure.

3.2 Thrombolytic therapy

Early injection of thrombolytic drugs is an effective measure to avoid the further development of acute myocardial infarction, when the patient is not able to complete the first balloon dilatation within 90 minutes or unable to meet the conditions of surgical treatment, if the patient has the indications for thrombolytic therapy, it can be used for thrombolysis, for the patients with acute ST-segment elevation myocardial infarction, if the thrombolysis can be carried out within 12 hours of the occurrence of the disease, it is possible to restore the blood perfusion of the myocardium as soon as possible to avoid the persistent necrosis of the myocardial cells. For patients with acute ST-segment elevation myocardial infarction, if thrombolysis can be carried out within 12 hours of the onset of the disease, there is a chance to restore myocardial blood perfusion as soon as possible to avoid persistent necrosis of cardiac muscle cells. Clinical studies have shown[10] that in the early stage of intravenous thrombolysis, thrombolytic drugs can indirectly or directly affect the function of the cardiac system, thus further dissolving the thrombus, unblocking the blocked coronary arteries, and enabling the normal operation

of myocardial blood perfusion. It reduces the degree of damage to the heart muscle cells, thus relieving the symptoms of arrhythmia, angina pectoris, heart failure, and reducing the size of myocardial infarction. Some studies have shown that the use of alteplase thrombolytic therapy has significant clinical effects, but this drug has a certain risk after use, so before using it, you need to carry out the corresponding bleeding risk assessment for the patient, if the patient's risk of bleeding is relatively large, you can't use thrombolytic therapy, or during the use of thrombolytic therapy, you have to closely monitor the patient's vital signs, and if there is a bleeding event, you have to immediately stop the thrombolytic therapy. If bleeding occurs, thrombolytic therapy should be stopped immediately. A large number of clinical practice has proved[11] that although the thrombolytic therapy program is relatively low cost and has a good therapeutic effect, but there are corresponding contraindications, even after the use of thrombolytic therapy, patients are also prone to myocardial infarction, so the use of the need to pay extra attention to ensure that the safety of the treatment as well as the effectiveness of the treatment.

3.3 Antiplatelet therapy

The implementation of anticoagulation therapy for patients with acute myocardial infarction is mainly based on antiplatelet therapy, and it has been found that the use of coronary interventional therapy for patients with acute myocardial infarction while taking anticoagulant and antiplatelet medications can greatly reduce the incidence of clinical complications. It is believed that the main cause of atherosclerosis is the formation of thrombus due to the aggregation of platelets, and when platelets are activated, they will produce substances such as thromboxane A₂, thrombin, etc., and when these substances are combined with fibrin, they will lead to the obstruction or narrowing of the blood vessels, which will induce ischemic necrosis of cardiac myocytes. Therefore, the treatment of acute myocardial infarction needs to pay more attention to the link of antiplatelet therapy, for patients of different ages, whether or not to use surgical treatment, need to carry out antiplatelet therapy first.

Gremopaplegrel, aspirin, prasugrel and tegretol are commonly used antiplatelet drugs in the clinic, and studies have shown that the use of aspirin combined with clopidogrel in the treatment of acute myocardial infarction can further avoid the aggregation of platelets[12], preventing the continued progression of atherosclerosis, unclogging blood vessels, and alleviating the degree of damage to the patient's myocardium. However, since antiplatelet drugs can easily increase the risk of bleeding in patients, it is necessary to do a detailed risk assessment of the patient before use, so as to improve the safety of drug use. In clinical practice, drugs and surgery are used to treat acute myocardial infarction[13], further improving the prognosis of patients, which has significant clinical value.

4. Summary

In summary, there are many treatment methods for patients with acute myocardial infarction, but the overall principle of treatment is to reduce the infarct area, save the dying myocardial cells, deal with various complications, and protect the cardiac function of the patients, and there are advantages and disadvantages of various treatment methods. In the future, it is hoped that safer, more economical and effective treatment options can be explored to maximize the therapeutic effect and improve the prognosis of patients.

References

- [1] ZHOU Weili, ZANG Shuting. Occurrence Characteristics and First Aid Measures of Cardiac Arrest Caused by Acute Myocardial Infarction Among Young and Middle-aged Patients[J]. *Military Nursing*. 2023;40(6):1-4. Doi: 10.3969/j.issn.2097-1826.2023.06.001.
- [2] XU Jinfang, HAN Yayan, CHEN Juan, et al. Effect of applying remote ECG monitoring-based guidance for phase II cardiac rehabilitation after percutaneous coronary intervention for acute myocardial infarction[J]. *Chinese Journal for Clinicians*,2023;51(10):1167-1169. Doi: 10.3969/j.issn.2095-8552.2023.10.011.
- [3] WAN Zunhui,WANG Zhenxia,ZHANG Cheng,et al. Study on related factors of slow blood flow or no reflow after emergency PCI for acute myocardial infarction[J]. *China Journal of Modern Medicine*. 2020;41(1):198-202. Doi: 10.3969/j.issn.1005-8982.2022.07.005.
- [4] DING Yan-ling, LIANG Lun-chang, LIANG Mao-jin, et al. Comparison of the effect of different timing of percutaneous coronary intervention in patients with acute myocardial infarction[J]. *Gansu Medical Journal*. 2022;41(1):35-36,41. Doi: 0.15975/j.cnki.gsy.2022.01.004.
- [5] ZOU Huawei, ZHOU Jinfeng, ZHAO Yong, et al. Comparative study of clinical efficacy and cardiac function of emergency PCI and delayed PCI in patients with acute non — ST segment elevation myocardial infarction[J]. *Journal of Clinical and Experimental Medicine*. 2021;20(16):1692-1696. Doi: 10.3969/j.issn.1671-4695.2021.16.004.

- [6] Xie W, Hu LT, Chen HT, et al. Construction of prediction model of coronary slow flow/no reflow after percutaneous coronary intervention in patients with acute myocardial infarction[J]. *Chinese Journal of Cardiovascular Research*. 2023;21(9):858-864. Doi: 10.3969/j.issn.1672-5301.2023.09.016.
- [7] LI Haipeng,ZHANG Jian. Two-year prognosis analysis of elderly patients with acute myocardial infarction after coronary artery bypass graft[J]. *Chinese Journal of Multiple Organ Diseases in the Elderly*. 2023;22(3):196-200. Doi: 10.11915. / j.issn.1641-5403.2023.03.040.
- [8] ZHANG Xitao,SU Pixiong,LIU Yan,et al. Application of emergency coronary artery bypass grafting in acute myocardial infarction[J]. *Chinese Journal of Emergency Medicine*. 2005;14(4):319-322.
- [9] LI Jing, CHENG Long, WANG Heyang, et al. Safety and efficacy of bivalirudin versus unfractionated heparin during perioperative period of percutaneous coronary intervention[J]. *Chinese Journal of Cardiology*. 2020;48(8):648-654. Doi: 10.3760/cma.j.cn112148-20200717-00566.
- [10] Dai ZG. Comparison of effect of early thrombolysis and interventional therapy in acute myocardial infarction[J]. *China Practical Medicine*. 2023;18(4):1-4. Doi: 10.14163/j.cnki.11-5547/r.2023.04.001.
- [11] LI Yanmin, FENG Yan, WEI Yanyun, et al. Predictive value of TRI,SII,CONUT score in the prognosis of acute myocardial infarction after percutaneous coronary intervention[J]. *Journal of North Sichuan Medical College*. 2023;38(7):906-909. Doi: 10.3969/j.issn.1005-3697.2023.07.009.
- [12] Wang X. Analysis of the effect of aspirin combined with hydrochloridogrel on cardiac function and inflammatory response in patients with acute myocardial infarction[J]. *Modern Diagnosis and Treatment*. 2023;34(12):1807-1809.
- [13] Gao Liansheng. Effect of aspirin and clopidogrel combined with tirofiban on the efficacy and adverse cardiovascular events in patients with diabetes mellitus with acute myocardial infarction[J]. *Contemporary Medical Symposium*. 2023,21(17):99-101. DOI:10.3969/j.issn.2095-7629.2023.17.030.