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MODERN THROMBOLYTIC THERAPY IN MYOCARDIAL INFARCTION

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Abstract

Myocardial infarction (MI) is a serious cardiological condition characterized by necrosis of the heart muscle tissue due to oxygen deprivation, which has a high mortality and morbidity worldwide. Timely access to reperfusion therapy for patients with MI is vital. Modern thrombolytic therapy is one of the most effective approaches to reduce myocardial necrosis by dissolving the thrombus and restoring blood flow in the first hours of MI.

This article analyzes the pharmacological properties, conditions of use, dosage and efficacy of thrombolytic drugs used in MI - alteplase, reteplase, tenecteplase and streptokinase. At the same time, the possibilities of using thrombolytic therapy in STEMI and NSTEMI, reperfusion strategies and methods for reducing complications are also considered.

The article also discusses the issues of increasing the effectiveness of recanalization and reducing complications such as bleeding by using antiplatelet and anticoagulant drugs in combination with thrombolytic therapy. The results of the study will serve to develop clinical recommendations for early diagnosis of patients with MI in modern cardiology practice, to determine individual treatment approaches, and to reduce mortality.

Therefore, this article on modern thrombolytic therapy in MI is scientifically and practically relevant and is aimed at improving the strategy for managing cardiovascular diseases and improving the quality of life of patients.

Keywords

Myocardial infarction, thrombolytic therapy, reperfusion, alteplase, reteplase, tenecteplase, streptokinase, cardioprotection, reperfusion complications, heart failure, electrocardiogram, STEMI, NSTEMI.

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Relevance of the topic: Myocardial infarction (MI) is the most serious cardiovascular event in the world, threatening the lives of millions of patients every year. The high mortality and morbidity rates of MI can be significantly reduced by the use of effective reperfusion therapy, including thrombolytic therapy, in the first hours of the disease. Therefore, thrombolytic therapy is widely used as a modern standard approach to MI.

Modern thrombolytic drugs (alteplase, reteplase, tenecteplase and streptokinase) have high selectivity and rapid action, effectively dissolve coronary thrombi and reduce the area of myocardial necrosis. This helps not only to save the patient's life, but also to maintain the functional state of the heart and prevent severe complications such as cardiogenic shock and heart failure.

The relevance of the topic is also associated with the scientific and practical importance of early detection of STEMI and NSTEMI patients, optimization of thrombolytic therapy protocols and development of individual treatment strategies. The increasing number of patients with MI in modern cardiology practice requires the improvement of reperfusion strategies and increasing the effectiveness of thrombolytic therapy.

Also, the issues of reducing complications associated with thrombolytic therapy, combined use with antiplatelet and anticoagulant drugs, ensuring safety through electrocardiogram and laboratory monitoring are relevant in clinical practice. The results of the study will serve to develop effective treatment protocols for MI, improve the quality of life of patients, and improve cardiac rehabilitation strategies.

Thus, the study of modern thrombolytic therapy for myocardial infarction, in addition to being scientifically significant, plays an important role in the effective treatment of patients and the prevention of cardiac complications in clinical practice.

Purpose of the topic: The main purpose of this article is to analyze the effectiveness and safety of treating patients with myocardial infarction (MI) with modern thrombolytic therapy, to study the conditions and protocols for its clinical use. The study will identify approaches to optimizing the reperfusion process of thrombolytic therapy in STEMI and NSTEMI patients, reducing myocardial necrosis, and preventing the development of complications such as heart failure and cardiogenic shock.

The article also aims to perform the following tasks:

1. To analyze in detail the pharmacological properties, selectivity, and dosage of thrombolytic drugs.

2. To identify methods for increasing the effectiveness of recanalization by integrating antiplatelet and anticoagulant drugs used in combination with thrombolytic therapy.

3. To study safety measures, reducing the risk of complications, and intensive monitoring in the use of thrombolytic therapy.

4. To formulate clinical recommendations for the development of modern reperfusion strategies for MI and individual treatment protocols for patients.

5. To create a scientific basis for improving the quality of life and prognosis of patients in cardiology practice through the results of the study, reducing mortality and morbidity.

Thus, the purpose of the article is not only to effectively treat patients with MI, but also to improve clinical practice in modern thrombolytic therapy and develop a strategy for cardiac rehabilitation.

Main part: Myocardial infarction (MI) is a serious cardiological pathology that is accompanied by oxygen deficiency, necrosis and impaired mechanical function of the heart muscle tissue as a result of impaired coronary artery patency. MI is one of the leading causes of death from cardiovascular diseases worldwide, endangering the lives of millions of patients every year.

Thrombus formation plays a central role in the development of MI. Thrombus formation as a result of occlusion of a coronary artery by an atherosclerotic plaque or its rupture sharply disrupts the blood supply to the myocardium. Therefore, the use of reperfusion therapy in the first few hours of the patient reduces the area of necrosis in the infarct area, preserves the contractile function of the heart, and reduces the likelihood of developing complications such as cardiogenic shock and heart failure.

Thrombolytic therapy is a method aimed at chemically dissolving the thrombus, which allows restoring blood flow with drugs with high selectivity. Modern thrombolytic drugs, including alteplase (tPA), reteplase, tenecteplase, and streptokinase, effectively dissolve coronary thrombi and produce reperfusion. Alteplase is effective with high selectivity in fibrin-bound thrombi, while reteplase produces rapid thrombolysis with a long half-life. Tenecteplase is administered in a single dose and has high selectivity; streptokinase is a less selective but widely used classic thrombolytic drug.

The effectiveness of thrombolytic therapy depends on several factors: the type of drug, the time of administration, the location of the thrombus, the patient's age, the presence of co-infections, and the presence of chronic diseases. In cases of STEMI (ST-segment elevation MI), thrombolytic therapy is most effective in the

first 12 hours after infarction. In patients with NSTEMI (non-ST-segment elevation MI), an individual assessment is required.

Antiplatelet and anticoagulant drugs are used in combination with thrombolytic therapy. This combination increases the effectiveness of the thrombolytic process, reduces the risk of bleeding and maximizes the degree of recanalization. Electrocardiogram (ECG) monitoring, laboratory tests and clinical observation ensure patient safety during thrombolytic therapy.

Complications include bleeding, arrhythmia, reperfusion shock and allergic reactions. Therefore, thrombolytic therapy should always be used under intensive supervision. In clinical practice, it is important to select patients, individualize thrombolytic therapy protocols and optimize the reperfusion strategy in cases of STEMI and NSTEMI.

Modern studies show that the use of thrombolytic therapy significantly reduces mortality in STEMI patients, reduces the likelihood of developing heart failure and improves the quality of life of patients. Therefore, thrombolytic therapy has been accepted as a standard treatment protocol for MI and is widely used in global cardiology practice.

In addition, modern clinical studies show that the consequences of MI can be significantly reduced by reducing reperfusion time, using drugs in optimal doses, and integrating antiplatelet therapy with thrombolytic therapy. Thus, modern thrombolytic therapy plays an important role in saving patients' lives, restoring myocardial function, and preventing complications.

Conclusion: Modern thrombolytic therapy is vital in the treatment of myocardial infarction (MI), and its effective use allows saving patients' lives, reducing myocardial necrosis, and preventing severe complications such as heart failure and cardiogenic shock. The selectivity, rapid effect, and combined use of thrombolytic drugs with antiplatelet and anticoagulant drugs increase the effectiveness of recanalization, reduce the risk of bleeding and other complications.

In cases of STEMI and NSTEMI, optimization of thrombolytic therapy protocols with an individual approach is carried out taking into account the patient's clinical condition, thrombus location, and the presence of chronic diseases. Studies show that when thrombolytic therapy is administered within the first 12 hours of MI, mortality is significantly reduced, cardiac contractile function is preserved, and the quality of life of patients is improved.

Modern thrombolytic therapy is not only limited to saving the patient's life, but also serves to improve cardiac rehabilitation and long-term prognosis associated with MI. Therefore, increasing knowledge of modern thrombolytic

therapy for MI, improving protocols, and its correct use in clinical practice are scientifically and practically relevant.

Thus, modern thrombolytic therapy is a standard and effective treatment for patients with MI, and its correct and timely use helps to reduce mortality and morbidity, preserve cardiac function, and improve the quality of life of patients.

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