

## CARDIOGENIC SHOCK ETIOLOGY, CLINIC, EXAMINATION METHODS AND MODERN METHODS OF TREATMENT

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**Abstract:** Cardiogenic shock is life-threatening. Often this is caused by a heart attack. Cardiogenic shock is life-threatening, with a high mortality rate of 30 to 50 percent. This means that almost every second person will not experience a heart attack. However, in recent years, the chance of survival has increased due to improved treatment. The most important thing is to open the blocked coronary artery as soon as possible and restore blood flow and oxygen supply. Those who survive the first 30 days after cardiogenic shock have a good chance of long-term survival.

**Key words:** Cardiogenic shock, pale skin, hypotension, first aid, prevention

### **Definition of cardiogenic shock**

Cardiogenic shock is life-threatening. Call an emergency doctor on 103. In cardiogenic shock, the heart suddenly stops pumping enough blood to the organs.

Cardiogenic shock (also called cardiac shock) causes the general symptoms of shock. These include, but are not limited to:

Low blood pressure, low blood pressure (hypotension)

Pale skin

Increased sweating

Cold hands and feet

Fast breathing

Shortness of breath

Fast heartbeat (tachycardia)

Weak pulse

Patients urinate less often than usual or no longer urinate

Loss of consciousness

In most cases, a heart attack is caused by cardiogenic shock. Then the following symptoms appear:

**Pain in the chest or behind the breastbone (chest pain):** lasts a few minutes, does not go away with rest and can spread to other parts of the body: arms, upper abdomen, back (between shoulder blades), neck region, or chin. Some also experience pain in the form of a strong burning sensation in the chest.

Tightness of the chest: there is a strong feeling of pressure or tightness in the area of the heart. Many describe it as an elephant sitting on their chest.

The veins of the neck are significantly bulging

Shortness of breath, shortness of breath

Anxiety, nervousness, tremors

Anxiety, sweating, fear of death

Nausea and vomiting

Dizziness

Feeling weak, losing consciousness

If you have symptoms of a heart attack or cardiogenic shock, call the emergency room or someone else right away. Every minute counts!

### **Cardiogenic shock - first aid**

Cardiogenic shock can cause loss of consciousness and cardiac arrest. Therapy should be started as early as possible. Cardiogenic shock is often accompanied by a heart attack. A heart attack, in turn, occurs as a result of narrowing of one or more coronary arteries with deposits. Often a clot blocks or obstructs one or more blood vessels. The supply of blood, oxygen and nutrients to the heart is reduced, the heart muscle tissues die.

Therefore, in the case of cardiogenic shock caused by a heart attack, the first goal of therapy is to open the blocked coronary artery that is causing the heart attack as soon as possible. A study conducted by various heart centers (the CULPRIT-SHOCK study) found that emergency surgeons do not need to dilate all narrowed coronary arteries at once. It is better to proceed step by step and first open only the "main character" - i.e. the main artery responsible for cardiogenic shock.

They insert a flexible plastic tube - a catheter - through the skin into a blood vessel and push it forward towards the narrowing.

At the end of the catheter is a small balloon. If it opens, the container expands. Blood flow and oxygen supply are restored.

After that, doctors implanted a small "vascular support" - a stent. This ensures that the container is always open.

Other methods of treatment of cardiogenic shock

Patients with cardiogenic shock require intensive therapy and serious treatment. In addition to cardiac catheterization, doctors use, in particular, the following treatment methods:

Medicines that support blood circulation: For example, active substances from the catecholamine group, such as dobutamine, norepinephrine or epinephrine.

Medicines that prevent blood clotting (in pill form or intravenously): For example, acetylsalicylic acid (ASA), prasugrel, ticagrelor, or heparin.

Mechanical Ventricular Assist Devices : These temporarily stabilize the cardiac output and help you survive in an emergency. Mechanical circulatory systems (MCS) relieve the heart and allow it to recover better. Today, doctors usually use extracorporeal circulatory support (ECLS), which can completely replace the heart and lungs. However, such devices are not mandatory for all patients with cardiogenic shock.

If the treatment is successful, the doctors try to gradually reduce the supportive measures and finally stop them completely.

Depending on the cause of cardiogenic shock, other treatments may be used. Doctors also often treat any indirect damage caused by cardiac shock

### **Cardiogenic shock: causes**

Cardiogenic shock can occur for various reasons. The most common cause of cardiac shock is a heart attack, in which the left ventricle usually stops working. In this case, one or more coronary arteries are narrowed or completely blocked by a blood clot. Blood flow is restricted, the heart muscle no longer receives enough oxygen, and heart muscle cells die. About 5-10% of heart attack patients experience cardiogenic shock. Then it is important that doctors act quickly!

### **Cardiogenic shock can occur for the following reasons:**

**Heart attack :** This is the most common cause of cardiogenic shock. People with a large anterior wall infarction with blockage of the left artery of the heart are especially at risk (rear wall infarction with blockage of the right artery of the heart is often "silent", that is, asymptomatic).

Inflammation of the heart muscle (myocarditis)

**Heart muscle diseases (cardiomyopathies):** There are different forms, but they all have one thing in common: the structure of the heart muscle changes. As a result, the pumping capacity of the heart decreases.

Heart failure

**Heart valve defects:** One of the heart valves no longer works properly.

**Heart Arrhythmia :** A very slow, very fast or irregular heartbeat

Thrombosis (formation of blood clots)

**Pulmonary embolism:** A blood clot travels deeper into the leg or pelvis and blocks blood vessels in the lungs.

**Tumors:** types of cancer that also affect the heart

**In pericardial tamponade due to pericarditis:** the heart constricts when pus or fluid collects in the pericardium.

**Tension pneumothorax:** In this case, air enters the pleural cavity of the lungs and can no longer escape.

**Medicines:** Some medicines are bad for the heart. These include, for example, cytostatics used in chemotherapy, beta-blockers or tricyclic antidepressants.

Cardiogenic shock is life-threatening, with a high mortality rate of 30 to 50 percent. This means that almost every second person will not experience a heart attack. However, survival rates have increased in recent years due to improved treatment. The most important thing is to open the blocked coronary artery as soon as possible and restore blood flow and oxygen supply. Those who survive the first 30 days after cardiogenic shock have a good chance of long-term survival.

The course of cardiogenic shock from a heart attack always depends on how well doctors prevent or limit multiple organ failure. Full recovery is not usually expected after a severe heart attack.

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