

Cardiac Arrest

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Key points

- Introduction
- Heart failure and Arrhythmia
- Tests for Diagnosis
- Treatment and Medications

The World Health Organization (WHO) identifies that in 2019, 17.9 million people died due to cardiovascular disease, 85% of which were caused by heart attack and stroke. Low awareness of cardiovascular disease can exacerbate the situation and increase mortality due to delays in treatment. This study aims to identify knowledge of heart attack and stroke in communities in West Sumatra Province and its relation to sex, ownership of health insurance, and delaying medical treatment due to cost. This study used a cross-sectional study design, conducted in West Sumatra Province from May to October 2020. The sample in this study was 223 people aged 18-54 years who were selected by simple random sampling. Data were analyzed by univariate analysis and bivariate analysis with the Mann-Whitney test. Most of the respondents have low knowledge about heart attacks and strokes and first aid response (57.4%). There was a significant mean difference in knowledge between the group of respondents who have health insurance and the group that did not. There was no significant mean difference in knowledge of respondents by sex and delaying medical care because of costs. Low of public knowledge about the symptoms of heart attack and stroke should be addressed as an important contribution to reducing mortality and morbidity due to heart attack and stroke.¹

Today, the world suffers from the spread of diseases very gravely.¹ The disease is an abnormal condition

that affects human effort, often associated with signs and symptoms and resulting from external causes such as infectious diseases such as COVID-19 or internal disorders such as heart failure. A healthy heart is a powerful pump that circulates blood throughout our bodies. It consists of four chambers: two atrium (left and right) and two. Both atria contract simultaneously at first and help fill the chambers. The two chambers then contract simultaneously to send blood to the organs. A good heart muscle should be able to pump blood well and be able to fill correctly. The heart pumps 5 liters of blood during rest per minute. This can be more than that and then double during the exercise. Oxygen-poor blood from the body comes through the vena cava to the right heart. The right heart pumps blood through the lungs, where the blood absorbs, among other things, oxygen.²

Heart Diseases

There are many types of heart diseases that influence human life and may lead to sudden death, where investigations and medical reports indicate that the most common causes of heart disease are narrowing or blockage of the coronary arteries, as well as blockage of the blood vessels that give the heart itself with blood. In the United States of America, one person dies every 36 seconds from heart disease and blockage of blood vessels. About 659,000 people die each year.

Heart Failure

This disease happens when the heart muscle does not pump blood when it should. It is categorized into chronic heart failure and acute heart failure. Certain conditions, such as clogged arteries or high blood pressure, gradually weaken the heart to fill and pump efficiently. In this disease, the heart's main pumping chambers (the ventricles) can become stiff and aren't fill appropriately between beats. In some cases, the heart muscle can become destroyed and powerless, and the ventricles tighten to the point that the heart cannot sufficiently pump blood to the body. Heart failure can concern the left ventricle, the right ventricle, or both. Naturally, heart failure begins on the left side, particularly the left ventricle (the main pump of blood). Any of the following situations can damage or weaken the heart and cause heart failure as heart attack and coronary artery disease, high blood pressure (hypertension), heart valves with problems, damage to the heart muscle, inflammation of the heart muscle, congenital disabilities, abnormal heart rhythms, and hypertrophic or restrictive cardiomyopathies [90][91]. Types of this disease are diastolic heart failure, left heart failure, right heart failure, and systolic heart dysfunction.²

Arrhythmia (Abnormal heart rhythm)

Historically, pulse palpation at bedside was the first clinical tool used in the detection of arrhythmias. The invention of the electrocardiogram (ECG) by Einthoven in 1895 permitted for a more nuanced understanding of rhythm disturbances. Physical exam and ECG, unfortunately, provide only snapshots of a patient's heart rhythm and thus are insufficient for correlating symptoms with possible rhythm

disturbances if they occurred infrequently or for identifying occult paroxysmal dysrhythmias.⁵ In fact, in the early studies that form our foundation for our current understanding of AF, the recognition of AF was limited to scenarios where a patient was symptomatic and sought care, at which time electrocardiogram confirmed AF, or where a patient was asymptomatic at the time of a medical encounter but found to be in AF on electrocardiogram that was obtained in response to an abnormal physical examination.³

Tests for Diagnosis

Tests to diagnose a heart attack include:

Electrocardiogram (ECG or EKG): This is the first test done to identify a heart attack, it records electrical signals as they travel through the heart. Sticky patches (electrodes) are attached to the chest and sometimes the arms and legs. Signals are recorded as waves displayed on a monitor or printed on paper. An ECG can show if you are having or have had a heart attack.

Blood test: Certain heart proteins gradually leak into the blood after heart damage from a heart attack. Blood tests can be done to check for these proteins (cardiac markers).

Chest X-ray: A chest X-ray shows the condition and size of the heart and lungs.

Echocardiogram: Sound waves (ultrasound) create images of the moving heart. This test can show how blood moves through the heart and heart valves. An echocardiogram can identify whether an area of your heart has been damaged.

Coronary catheterization (angiogram): A long, thin tube (catheter) is inserted into an artery, usually in the leg, and guided to the heart. Dye flows through the catheter to help the arteries show up more clearly on images made during the test.

Treatment

Each minute after a heart attack, more heart tissue is damaged or dies. Urgent treatment is needed to fix blood flow and restore oxygen levels. Oxygen is given immediately. Specific heart attack treatment depends on whether there's a partial or complete blockage of blood flow.

Medications

Medications to treat a heart attack might include:

Aspirin: it reduces blood clotting. It helps keep blood moving through a narrowed artery. If you called 911 or your local emergency number, you may be told to chew aspirin. Emergency medical providers may give you aspirin immediately.

Clot busters (thrombolytics or fibrinolytics): These drugs help break up any blood clots that are blocking blood flow to the heart. The earlier a thrombolytic drug is given after a heart attack, the less the heart is damaged and the greater the chance of survival.

Other blood-thinning medications. A medicine called heparin may be given by IV or injection. Heparin makes the blood less sticky and less likely to form clots.

Nitroglycerin: This medication widens the blood vessels. It helps improve blood flow to the heart. Nitroglycerin is used to treat sudden chest pain (angina). It's given as a pill under the tongue, as a pill to swallow or as an injection.

Morphine: This medicine is given to relieve chest pain that doesn't go away with nitroglycerin.

Beta blockers: These medications slow the heartbeat and decrease blood pressure. Beta blockers can limit the amount of heart muscle damage and prevent future heart attacks. They are given to most people who are having a heart attack.

ACE inhibitors: These drugs lower blood pressure and reduce stress on the heart.

Statins: These drugs help lower unhealthy cholesterol levels. Too much bad (low-density lipoprotein, or LDL) cholesterol can clog arteries.⁴

Cardiac rehabilitation

Cardiac rehabilitation is a personalized exercise and education program that teaches ways to improve heart health after heart surgery. It focuses on exercise, a heart-healthy diet, stress management and a gradual return to usual activities. Most hospitals offer cardiac rehabilitation starting in the hospital. The program typically continues for a few weeks or months after you return home. Cardiac rehabilitation is an evidence-based intervention that aims to improve health outcomes in cardiovascular disease patients, but it is largely underutilized. One strategy for improving utilization is home-based cardiac rehabilitation (HBCR). Previous research has shown that HBCR programs are feasible and effective. However, there is a lack of evidence on safety issues in different cardiac populations. This systematic review aimed to provide an evidence-based overview of the safety of HBCR.⁵

References

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