

HEART ATTACK

What is heart attack?

Heart attack or Myocardial Infarction (MI) is damage or death of part of the heart muscle. The heart is a muscle that needs a constant supply oxygen rich blood.

A heart attack occurs when the supply of oxygen rich blood to an area of heart muscle is blocked, usually by a clot in the coronary artery. If blood cannot reach the heart muscle, it will die which can lead to a heart attack [1].

Risk factors

High blood pressure - high blood pressure forces the heart to work harder, causing damage over time [2].

Diabetes - high blood sugar, if uncontrolled, can lead to increased plaque in your arteries.

Overweight- is linked with high blood cholesterol levels, high triglyceride levels, high blood pressure and diabetes.

High cholesterol - the extra cholesterol can build up in the walls of the arteries, including those of the heart. This leads to narrowing of the arteries and can decrease the blood flow to the heart.

Smoking - smoking can damage the heart and blood vessels, which increases the risk for heart conditions such as heart attack.

Family history- If your siblings, parents or grandparents have had early heart attacks (by age 55 for males and by age 65 for females), you might be at increased risk.

Common signs of heart attack

- Pain or discomfort in chest
- Lightheadedness, nausea or vomiting
- Jaw, neck or back pain
- Discomfort or pain in arm or shoulder
- Shortness of breath

Prevalence

Heart attack is a leading cause of morbidity and mortality worldwide. Heart attack, was the **number one killer** of men in Malaysia.

In 2018, a total of 18,267 people in Malaysia died from ischemic heart disease, averaging 50 deaths a day. This number comprised of 68% men (12,510) and 32% women (5,757) [3].

How does mesenchymal stem cell (MSC) therapy help heart disease?

Heart attack is caused by the death of the heart muscle cells (cardiomyocytes) in the left ventricle as a result of decreased blood supply after blockage of a branch in the left coronary artery. Current pharmacological treatment available might help to slow down the progression of heart muscle cells death but cannot restore the function of damaged heart tissue.

Mesenchymal stem cell transplantation is considered as a promising way to treat heart attack because its properties to replicate, repair and regenerate. Studies have demonstrated their abilities to induce immunomodulatory and anti-inflammatory effects which lead to their capacity to avoid rejection by recipient of donor cells [4].

Evidence from studies have shown that patients treated with MSC had improvement in left ventricular ejection fraction (LVEF). The results of these studies have demonstrated the safety and efficacy of MSC therapy in patients with heart disease [5].

Benefits of mesenchymal stem cell (MSC) therapy for heart condition

Our MSCs have been shown to have the ability to self-replicate, differentiate into heart muscle cells, reduce inflammation and induce growth of new blood vessels.

The safety and efficacy of our MSCs therapy in the therapy of cardiovascular disease and heart attack has been demonstrated in published human clinical studies.

MSCs therapy has been shown to:

- improve left ventricular ejection fraction
- improve in quality of life
- reduce hospital readmission
- reduce rate of heart transplantation

Success stories

Story 1

Our very own successful clinical research proof a double-blind, randomized controlled study of 116 patients with acute ST-elevation MI were randomly given Wharton's Jelly stem cells (WJMSCs) or placebo. The study showed the WJMSCs treatment was safe in treating patients with an AMI attack and could significantly improve myocardial viability and heart function [6].

Story 2

A systemic review of studies involving 1,148 patients with acute heart attack revealed that patients treated with stem cells had increased left ventricular ejection fraction (LVEF) and improvement in quality of life which suggest that stem cells therapy is safe in treating patients with acute heart attack [7].

Story 3

A clinical study of 53 patients with heart attack who had intravenous bone marrow derived mesenchymal stem cells (BM-MSCs) therapy demonstrated improvement in left ventricular ejection fraction (LVEF). In addition, reduced episodes of ventricular tachycardia and improved pulmonary function tests were also evidenced in the patients that received BM-MSCs therapy [8].

About Us: 23 Century International Life Science Centre

23 Century Group is a pioneer status high-tech corporate major in cell manufacturing. Our technical counterpart, Beike Biotechnology Co. Ltd, has more than twenty years experiences in the development of stem cell therapies and their associated clinical applications, holding more than 67 patents in China. With the advanced cell preparation expertise, 23 Century Group is currently the owner to largest CGMP cell preparation laboratory in Malaysia. It will be synchronised to more than 30 laboratories throughout China.

The group has jointly formed cooperation with more than 400 domestic and overseas research and medical institutions, published more than 50 journals. Our aim is to promote health by providing hope to patients who suffer from diseases which are incurable from modern medicines using cells as a treatment option.

Reference:

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