

Myocarditis

Myocarditis is an inflammation of the heart muscle. There are various causes. Depending on the cause and severity, symptoms and possible problems can range from no symptoms at all, to life-threatening heart failure.

What causes myocarditis and who does it affect?

Myocarditis means inflammation of the myocardium. The myocardium is the heart muscle. Myocarditis can affect anyone and occur at any age. There are various causes - many are mild, and some are serious.

Causes include the following:

Unknown cause ('idiopathic myocarditis')

In many cases the cause is not found. (Some of these cases are probably due to a viral infection which is never confirmed by tests.)

Viral infection

Many types of virus infection can affect several parts of the body, including the heart muscle. So, myocarditis may develop at the same time as, or just after, a viral throat or chest infection, or when you have flu. The body's immune system can clear many types of virus. So, many cases of viral myocarditis go away on their own within a week or so. Viral myocarditis often occurs at the same time as viral pericarditis (inflammation of the sac-like tissue which surrounds the heart. See separate leaflet called 'Pericarditis'.)

A virus called coxsackie B is the most common virus to cause myocarditis in the UK. Other viruses which sometimes cause myocarditis include: echoviruses, influenza (flu), Epstein-Barr (glandular fever virus), rubella (german measles virus), varicella (chickenpox virus), mumps, measles, parvoviruses, yellow fever, dengue, polio, rabies, and the viruses that cause hepatitis A and C.

Sometimes the inflammation in the heart lasts longer than other features of the infection. The virus may have 'gone' but the immune system may 'over-react' and cause inflammation which persists for a time in the heart.

Other causes

Other causes of myocarditis are much less common. They include:

- **HIV infection.** About 1 in 10 people with HIV develop myocarditis. This may be because the virus directly infects the heart, or because the immune system is weakened and the heart is infected with other germs.
- **Other types of infection.** The heart can sometimes become infected by various bacteria, fungi, parasites and other germs. For example:

- Infection of the heart muscle sometimes develops as a complication to endocarditis (infection of the lining of the heart and/or heart valves.) Many different germs can cause endocarditis. See separate leaflet called 'Infective Endocarditis'.
- Diphtheria. In some people who have diphtheria, a toxin (poison) made by the bacteria in the throat can cause a severe inflammation in the heart. This can quickly cause heart damage. Diphtheria is now uncommon due to immunisation.
- Chagas' disease. This is an infection caused by a protozoan called *Trypanosoma cruzi*. You can catch this infection from an insect bite in certain tropical countries. World-wide, this is a common cause of myocarditis (but is rare in the UK). With this infection a form of myocarditis develops many years after the initial infection. This leads to a gradual destruction of heart tissue which can cause severe heart failure.
- Lyme disease. This is an infection caused by a bacterium called *Borrelia burgdorferi*. You can catch this infection from a tick bite in certain countries. Myocarditis develops in about 1 in 10 cases of lyme disease.
- **Giant-cell myocarditis.** This is rare, and gets its name from abnormal cells which develop in the heart. The cause is not known but tends to develop in some people who have a thymoma (a growth of the thymus gland), systemic lupus erythematosus (SLE or lupus), or thyrotoxicosis (overactive thyroid).
- **A rare side-effect** of some medicines.
- **Other damaging agents.** For example, inflammation in the heart can be caused by excess alcohol, radiation, chemicals (such as hydrocarbons and arsenic), and certain poisons.
- **Rejection** following a heart transplant.
- **A rare complication** of various other diseases.

What are the symptoms of myocarditis?

The symptoms depend on the cause and severity of the inflammation. Many people with viral myocarditis do not have any heart-related symptoms. The heart inflammation may be suspected by some changes on an ECG (see below). If symptoms do develop they can include:

- chest pain.
- fever (raised temperature).
- a fast heartbeat - faster than usual for a normal fever.
- tiredness.

What are the possible complications?

Complications may develop if the inflammation damages the heart muscle, or damages the fibres that conduct the electrical impulses in the heart. Complications develop quickly in some cases following acute (sudden onset) symptoms listed above. Some cases of myocarditis develop gradually (such as in Chagas' disease) and have no 'acute' symptoms. But, the complications may be the first indication that you have longstanding inflammation to the heart which has caused damage.

Possible complications include:

- sudden loss of consciousness (syncope).
- cardiac arrhythmias (abnormally fast, slow or irregular heartbeats).
- heart failure which can cause shortness of breath, swelling of the legs and tiredness. (See separate leaflet called 'Heart Failure'.)

How is myocarditis diagnosed?

The symptoms may alert a doctor to the possible diagnosis. An ECG test may show some abnormality. A range of other tests may be advised to try and find the cause of the inflammation. For example, blood tests, a scan of the heart (echocardiogram), and other tests.

What is the treatment of myocarditis?

Treatment depends on the cause and severity. For example, if you only have mild viral myocarditis, no particular treatment is necessary. Painkillers will help to ease chest pain and fever. You may be advised not to do strenuous exercise until your ECG has returned to normal.

For the more uncommon causes, or if complications develop, a range of treatments may be needed. For example:

- Oxygen.
- Medication to treat heart failure or arrhythmias.
- A pacemaker if certain arrhythmias develop.
- Antibiotics if the cause of the myocarditis is a bacterial infection.
- Steroid medication if the cause is giant-cell myocarditis.
- Stopping alcohol if alcohol is the cause.

What is the prognosis (outlook)?

In most cases of viral myocarditis, the illness goes away on its own, and there are no complications. Symptoms may last only a few days or weeks. However, some types of viral infection are more serious and can cause more severe or persistent inflammation and complications.

In some cases, complications develop. This is more likely with the more uncommon causes of myocarditis. Sometimes the inflammation clears but the heart is left with some permanent damage and you may be left with a degree of heart failure which may require long-term medication.

In some cases, the inflammation and heart damage is so severe that the only treatment option is a heart transplant.

Some cases of 'sudden death' are thought to be due to severe myocarditis which develops quickly.