

Atherosclerosis

Atherosclerosis is the medical term for what most of us refer to as “clogging of the arteries”, usually with fatty substances such as cholesterol. Atherosclerosis occurs when arteries become clogged up by fatty substances called plaques or atheromas. This build up of plaque is the root cause of various cardiovascular diseases such as angina, heart attack, stroke and peripheral vascular disease. About 10,000 people die each year from cardiovascular disease (CVD), including coronary heart disease (CHD), stroke and other circulatory diseases. CVD is the most common cause of death in Ireland, accounting for 36% of all deaths. The largest number of these deaths relate to coronary heart disease, mainly heart attack, accounting for 5,000 deaths. 22% of premature deaths (under age 65) are from CVD. Atherosclerosis is the underlying cause for CHD. In atherosclerosis, plaques cause affected arteries to harden and narrow which is potentially dangerous for two reasons:

- Restricted blood flow can damage organs and stop them functioning properly.
- If a plaque ruptures, it can lead to a blood clot that blocks the blood supply to the heart, triggering a heart attack, or the brain, triggering a stroke.

Cardiovascular disease (CVD)

Atherosclerosis is a major risk factor for many conditions involving the flow of blood. Collectively, these conditions are known as cardiovascular disease (CVD). Examples of CVD include:

- peripheral arterial disease: where the blood supply to the legs is blocked, causing muscle pain
- coronary heart disease: where main arteries that supply the heart (the coronary arteries) become clogged with plaque
- stroke: where blood supply to the brain is blocked
- heart attack: where blood supply to the heart is blocked

Causes

Certain factors increase the risk of atherosclerosis. These are mainly lifestyle related and include:

- smoking
- a high-fat diet
- a lack of exercise
- being overweight or obese
- having either type 1 or type 2 diabetes
- having high blood pressure (hypertension)
- having high cholesterol

Over the course of years and decades, plaque build up narrows the arteries and makes them stiffer. This makes it harder for blood to flow through them. Clots may form in these narrowed arteries and block blood flow. Pieces of plaque can also break off and move to smaller blood vessels, blocking them. Either way, the blockage starves tissues of blood and oxygen, which can result in damage or tissue death.

Apart from being a cause of heart attack and stroke, if a clot moves into an artery in the lungs, it can cause a pulmonary embolism which is a potentially life threatening clot in a blood vessel in the lungs. In some cases, the plaque can also cause a weakening of the wall of an artery. This can lead to an aneurysm. Aneurysms can rupture and cause bleeding that can be life threatening.

Who is affected?

Arteries naturally get harder as a person grows older. Therefore, atherosclerosis tends to be more common in people over 40 years of age. Atherosclerosis is more common in men than women, probably because oestrogen provides some protection against the effects of atherosclerosis. Atherosclerosis (and the resulting cardiovascular diseases) is the single biggest cause of death in the developed world, accounting for one in three of all deaths.

The arteries

The circulation system is made up of arteries and veins. The blood is pumped from the heart and through the aorta (the main artery leading from the heart) before travelling through smaller and smaller arteries that branch off from each other.

The blood passes into tiny blood vessels, known as capillaries, where the oxygen in the blood is transferred into the cells of the body's tissues and organs. The blood returns to the heart through the veins. Two particularly important arteries are the coronary arteries which provide blood to the heart and the carotid arteries which supply blood to the brain

Symptoms

Atherosclerosis does not usually produce symptoms until blood circulation becomes restricted or blocked, leading to cardiovascular disease (CVD). The type of CVD and its associated symptoms will depend on where the blockage occurs.

Conditions caused by atherosclerosis include:

- Peripheral arterial disease- blockage of arteries to the limbs, mainly the legs.
- Angina- Reduced blood supply to the heart leading to pain and discomfort in the chest after any physical activity
- Aneurysm- a rupture in a blood vessel in the brain
- heart attack- blockage in the blood supply to the heart
- stroke- blockage of the blood supply to the brain

More detailed information on these medical conditions can be viewed at www.whelehans.ie or ask our staff for more information.

Causes

As we get older our arteries naturally begin to harden and narrow leading to atherosclerosis.

A number of things that accelerate this process:

- High-fat diets and cholesterol
- Smoking
- High blood pressure
- Diabetes
- Obesity
- Excessive Alcohol intake
- Family history (it tends to run in families)
- Ethnicity (It is more common among people of African and African-Caribbean descent)
- Air pollution

Treatment

Treatment for atherosclerosis aims to prevent the condition from worsening to the point that it can trigger a serious complication such as a heart attack.

This can be achieved by making lifestyle changes, such as eating a healthier diet or increasing exercise. There are several medications available to treat many of the underlying causes of atherosclerosis, such as a high cholesterol level and high blood pressure. Antiplatelet medication such as aspirin thins blood so helps prevent clots. In some cases surgery may be required to widen or bypass a section of a blocked or narrowed artery.

Surgery

Surgery may be required if certain important blood vessels become narrowed including the coronary and carotid arteries.

Coronary angioplasty

Coronary angioplasty is a type of surgery used to widen the coronary arteries. A long, flexible plastic tube called a catheter is inserted into a blood vessel and a balloon attached to the catheter is inflated to widen the artery. A small metal tube called a stent is often used to help keep the artery open.

Coronary artery bypass graft

A coronary artery bypass graft (CABG) can be used to treat narrowing of the coronary arteries. During a CABG, healthy blood vessel segments (grafts) are taken from other parts of the body in order to bypass the blocked artery. Segments of vein taken from the legs, arms and chest are used to create a new channel through which blood can be directed past the blocked part of the artery. This enables more blood to get through to the heart muscle.

Carotid arteries

Surgery is usually only recommended to widen the carotid arteries if the person has experienced previous symptoms related to a blocked blood supply, such as a stroke or transient ischaemic attack (TIA). Unlike the coronary arteries, preventative surgery on the carotid arteries is not usually recommended, except in cases where testing shows high levels of narrowing. Studies show the benefits achieved in reducing the risks of a stroke in most people without any symptoms are outweighed by the risks associated with surgery.

Carotid endarterectomy

A carotid endarterectomy is the most commonly used method of widening the carotid artery (the main artery in the neck). During the procedure a cut is made into the narrowed part of the artery and the inner lining of the artery is removed, along with any plaque inside it. Most surgeons sew a patch into the opening to widen this section of the artery.

The patch may be taken from a vein in the thigh or it may be synthetic. Using a patch can reduce the risk of having a stroke after the operation, as well as reducing the likelihood of the artery becoming narrowed again.

Carotid angioplasty

A carotid angioplasty uses a balloon catheter. The catheter is inserted into the femoral artery (the body's main blood vessel) in the groin. Under the guidance of X-ray, the catheter is threaded up into the femoral artery until it reaches the carotid artery. The balloon is then inflated to around 5mm in diameter. This expands the artery, clearing the narrowing so blood is able to flow through it again.

Carotid angioplasty is a less invasive type of surgery than carotid endarterectomy, meaning less post-operative pain and a faster recovery time. However, research carried out during 2009 found people who had a carotid angioplasty were more likely to have re-narrowing of the carotid artery compared with those who had a carotid endarterectomy.

Extracranial to intracranial bypass

A new type of surgery used to treat blockage of the carotid artery is known as an extracranial to intracranial bypass. In this type of surgery a section of blood vessel found outside of the skull is diverted and used to bypass the site of the blockage so the blood supply to the brain can be restored. Extracranial to intracranial bypass is still very much an evolving field of treatment and it is unclear how effective or safe it may be in the long-term.

Disclaimer: Please ensure you consult with your healthcare professional before making any changes recommended

For comprehensive and free health advice and information call in to Whelehans, log on to www.whelehans.ie or dial 04493 34591.