

Arteriosclerosis symptoms and causes



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Introduction

Arteriosclerosis is a general term that refers the hardening as well as the loss of elasticity in the arterial wall. It happens when the arteries transport oxygen and nutrients from the heart to the rest of the body become thick and stiff, sometimes obstructing blood circulation to the organs and tissues. Healthy arteries are flexible and adaptable but arterial walls could harden over time.(Mayo Clinic, 05/2014) The term is generally used interchangeably with Atherosclerosis, the most common form and also the most serious and clinically relevant as it is the major factor of coronary artery disease and cerebrovascular. Atherosclerosis happens when atheroma or plaque, builds up inside the arteries, that is made up of cholesterol, fatty substances, cellular waste products, calcium and fibrin (a clotting material in the blood) (American Heart Association, 04/2014).

While it is hard to estimate how common the disease is, it is suspected that almost all adults have the condition to certain extent. The arteries naturally get stiffer as you age, especially after the age of 40. This particular disease is one of the major causes of death in developed nations, amounting to one in three of all deaths. In England and Wales there is an estimated 124, 000 deaths that are related arteriosclerosis each year. (NHS UK, 06/2014)

Symptoms

Atherosclerosis usually does not show any signs or symptoms until it has developed severely that narrows or totally blocks an artery that it could not supply sufficient blood to the organs and tissues, many may not even notice

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they have the disease until they need medical attention when incidents such as a heart attack or stroke happens

Symptoms of moderate to serious atherosclerosis appear is localized to which arteries in the body is affected.

- Coronary arteries

The coronary arteries supply oxygenated blood to the heart, and if blocked would cause Coronary heart disease (CHD) a common symptom would be angina. Angina is chest pain or discomfort that happens when the cardio muscle is deprived of oxygenated blood. Angina may feel like burden or squeezing in the chest that could also happen in other parts of the body including shoulders, arms, neck, jaw, or back. The pain may even feel like indigestion and tends to worsen with activity and fade away during rest. Emotional stress can trigger the pain as well. In addition, CHD could also cause shortness of breath and arrhythmias that are problems with the consistency in heartbeat rate. If the plaque forms in the heart's smallest arteries, it is called coronary microvascular disease (MVD) which the symptoms include angina, shortness of breath, sleep problems, fatigue and tiredness, and lack of energy. (National Heart, Lung and Blood Institute, 2014)

- Carotid Arteries

The carotid arteries supply oxygenated blood to the brain. And if blocked would result in carotid artery disease or even cerebrovascular disease and may have stroke-like symptoms including, sudden weakness, paralysis (inability to move) or numbness of the face or limbs especially on one side of

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the body, confusion, difficulty in speaking or understanding speech, trouble seeing in one or both eyes, difficulty in breathing, faintness, trouble walking, loss of balance or coordination, and unexplained falls, being unconscious and sudden severe headache.(National Heart, Lung and Blood Institute, 2014)

These signal a transient ischemic attack (TIA), or a “ mini-stroke” which only lasts for a couple minutes to several hours before disappearing completely. However, if left untreated, it may progress to a stroke (Mayo Clinic, 2014)

- Peripheral arteries

Plaque can also build up in the major arteries that stream oxygenated blood to the limbs and pelvis which is called the peripheral arterial disease or peripheral vascular disease. The most communal symptom of peripheral arterial disease is pain in the legs, usually in one or both thighs, hips or calves. The pain could be described like a cramp, or a feeling of dullness or heaviness in the legs’ muscle. The pain typically comes and goes and could worsen when exercising that involves the legs like walking or climbing stairs. Some other signs of peripheral arterial disease may also appear, including weakness or numbness in the legs, having wound that is difficult in recovering due to poor supply of blood, a change in the color of the skin of the legs, hair loss on the legs or feet, thickening of the toenails, as well as erectile dysfunction, otherwise known as impotence due to insufficient blood supply to the genitalia. (National Health Service choices UK, 2014)

- Renal Arteries

Renal arteries are arteries that carry blood to the kidneys and if blocked one may develop chronic kidney disease. Several kidney functions may lose over time due to the disease. Early kidney disease usually has no symptoms, but <https://assignbuster.com/arteriosclerosis-symptoms-and-causes/>

as it progresses, several signs may emerge like tiredness, changes in frequency of urination, loss of appetite, nausea (upset stomach), puffiness in the hands or feet, itchiness or numbness and difficult to focus. (National Heart, Lung and Blood Institute, 2014)

- Aneurysm

If atherosclerosis weakens the walls of the blood vessels, it can cause aneurysm (a bulge in a blood vessel) to form. If it becomes too large, there is a risk of rupture, which can result in potential fatal internal bleeding and organ damage. Aneurysm can develop anywhere in the body, brain aneurysm and aortic aneurysm being the most prevalent types. The rupture of the bulge could lead to heart attack as well as stroke.

Heart Attack

If one of the plaques in your arteries ruptures, it could form a blood clot that blocks the blood supply to the heart, causing heart attack. Symptoms of a heart attack such as pain radiates in the centre of the chest giving the sense of pressure, tension or pressing. The pain can also be felt as if it is travelling to the limbs as well as abdomen. One would also have an overpowering sense of anxiety comparable to a panic attack, difficulty in breathing, feeling sick, lightheaded-ness, coughing, vomiting and wheezing.

Stroke

Plaques that rupture inside the brain would also block the blood supply to the brain, causing a stroke. The common symptoms would be in the face causing one side of it to fall and the inability to do facial expressions. One may be

unable to lift both their arms for long due to the weakness or numbness of the arms. Besides, the person's speech may also be slurred as the muscles of the mouth are not fully functional. There may also be other signs such as dizziness, problems with communication (like unable to speak or understanding others' speech), the loss of balance and co-ordination, inability to swallow, severe headaches, numbness or weakness resulting in complete paralysis in one side of the body and in severe cases, loss of consciousness. (National Health Service, 2014)

Causes

Arteriosclerosis develops slowly and gradually as a person ages, the real cause for it is not definite. However, there are several risk factors which would accelerate the hardening and narrowing of the arterial walls.

- High-fat diets and cholesterol

Cholesterol is a type of fat that is vital for the body to function properly. It helps in producing hormones, making up membranes that act as a protective layer for the cells. Cholesterol can be categorized into low-density lipoprotein (LDL) and high-density lipoprotein (HDL). LDL is often known as the “bad cholesterol” and is generally found in food that is high in saturated fat. LDL carries cholesterol from the liver to the cells that requires it, any excess cholesterol would be building up in the artery walls, which leads to fatty deposits which over time block the blood supply eventually. Consumption of foods high in saturated fat ranging from biscuits, cakes, processed meat, to cream should be monitored. In addition to food intake, the lack of regular

exercise would also contribute to the increase in LDL cholesterol level in the body (National Health Service, 2014)

- Smoking

Smoking can damage the walls of the arteries. Blood cells known as platelets will then cluster together at the spot of the damage for repair which cause the arteries to narrow. Besides, smoking also causes the blood cells unable to carry oxygen around the body, increasing the likelihood of a blood clot happening.

- High blood pressure

High blood pressure or hypertension, will damage the arteries in the same way as cigarette smoke. The arteries are intended to pump blood at a fixed pressure and if that pressure is exceeded, the arterial wall will be damaged. Hypertension is the result of being overweight, excess alcohol intake, stress, smoking as well as the lack exercise. (NHS)

- Family history

Family history could also affect the likelihood of one's getting arteriosclerosis. If the person have a close relative (a parent, brother or sister) with atherosclerosis and cardiovascular disease, the chance of developing similar problem compared with the rest of the population is twice as high. (NHS)

Diagnosis

Symptoms of atherosclerosis do not emerge until cardiovascular disease happens, those at risk of developing the condition ought to be tested.

The doctor may conduct a physical exam to find signs of constricted, enlarged or hardened arteries like a weak or lacking pulse below the narrowed region of the artery, reduced blood pressure in the limb, or whooshing sounds (bruits) over the arteries, heard using a stethoscope, or indications of a pulsating lump (aneurysm) in the abdomen region or at the back of the knee, or evidence of poor wound recovery in the region where the blood flow is restricted.

Further diagnostic tests could be suggested depending on the result of the physical exams including,

Blood tests could detect cholesterol and blood sugar levels, and could be well indicators for atherosclerosis. The patient is required to fast by eating or drinking nothing but only water for 12 hours before the blood test to ensure a more accurate result.

Doppler ultrasound could also be used to measure the blood pressure at several points along the limbs. It involves using a special ultrasound device, and these measurements could help the doctor to gauge the degree of any blockage as well as how fast is the blood flow in the arteries.

Electrocardiogram (ECG) records electrical signals as they go through your heart. An ECG can usually uncover sign of a prior heart attack. The doctor may require the patient to exercise in order to increase the activity level during ECG, if the signs and symptoms happen most frequently during exercise.

Stress test, also called as exercise stress test, could be used to gather information about how well the heart operates during physical activity. It could reveal problems within the heart that might not be noticeable otherwise as exercising makes the heart pump harder and faster than it does during daily activities. Performing such test may involve walking on a treadmill or riding stationary bike with the heart rhythm and blood pressure and breathing being monitored.

Cardiac catheterization and angiogram is a test that shows if the coronary arteries are restricted or obstructed. A colored ink is injected into the arteries of the heart using a long, thin tube (catheter) that is fed through an artery, usually in the leg, to the arteries in the heart. As the ink circulates the arteries, blocked regions would be revealed and shown on X-ray.

Other imaging tests like ultrasound, computerized tomography (CT) scan and magnetic resonance angiography (MRA) can also show toughening and thinning of large arteries as well bulges (aneurysms) and calcium deposits in the inner arterial walls. (Mayo Clinic, 2014)

Prevention/Treatment

Patient with risk of developing a cardiovascular disease (CVD) as a result of atherosclerosis will be advised to change his or her lifestyle to reduce this risk. There are several ways one can adopt to reduce the risk such as

Eating a healthy diet by limiting the saturated fat intake that would increase the level of bad cholesterol (LDL) in the blood, while eating a small amount

of unsaturated fat could help reduce any blockage in the arteries with the increase in good cholesterol (HDL) levels

Stop smoking immediately as it is one of most major risk factors that contribute to both heart attacks and strokes,

Exercising regularly is vital as it helps to keep the blood pressure as well as the heart condition in check. Low impact activities such as walking or swimming are recommended for those who have a history of cardiovascular disease. Besides strengthening the heart and lungs, exercising also helps to lose weight so the heart would not have to work harder to pump blood to the rest of the body. Moderate alcohol intake would also play a role in ensuring blood pressure not to exceed recommended level as well as calories intake.

(National Health Service, 2014)

Medication

Cholesterol medication, the doctor may choose from a range of cholesterol medications like statins and fibrates, to aggressively lower the bad cholesterol (LDL) which can relax, stop or even reverse the accumulation of atheroma in the arteries. Some of the medications like statins have additional effects in stabilizing the lining of the heart arteries and prevent atherosclerosis.

Beta blocker medications are commonly used for diseases concerning the coronary arteries. They help in lowering the heart rate and blood pressure, reducing demand on the heart and often relieve symptoms of chest pain, as well as reducing the risk of heart attacks and some rhythm problems.

Surgery

In addition to medication, surgery may be another alternative if the symptoms are severe or a blockage is life-threatening

Angioplasty and stent placement

A procedure to open narrowed or blocked coronary blood vessels that supply blood to the heart. A long, thin tube (catheter) is inserted into the congested or narrowed part in the artery and a second catheter with a deflated balloon on its tips is then gone through the catheter to the affected region. After compressing the deposits against the artery walls when the balloon inflates, a mesh tube (stent) is usually remained in the artery to help widen the artery.

Bypass surgery refers to procedure involves creating a graft bypass with a vessel from another body part or a man-made fabric. This lets blood to move around the congested segment of the artery. Segments of vein taken from the limbs and chest are used to make a new passage through which blood can be directed and allows more blood to get through to the heart.

Endarterectomy, or Carotid endarterectomy depends on where the plaque buildup is located, is a surgery to remove the fatty deposits from the walls of a narrowed artery. During the procedure, an opening is made into the constricted part of the artery. The surgeon often sew a patch taken from a vein in the thigh or made synthetically into the open to widen the section of the artery, it helps in reducing risk of having a stroke after the operation.

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