

Lifestyle & Culture

Peripheral Arterial Disease and diabetes: What's the link?



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Peripheral Arterial Disease (PAD) is a common circulatory disorder affecting millions worldwide. It occurs when there is a narrowing or blockage of the blood vessels, primarily the arteries that supply blood to the legs and feet. PAD often coexists with diabetes mellitus (DM), a metabolic disorder characterised by high blood glucose levels. Today's article aims to shed light on the connection between PAD and DM, elucidating their symptoms and risk factors among other things.

What are PAD and DM?

As mentioned earlier, PAD is a condition characterised by the narrowing and/or blockage of arteries due to atherosclerosis. Atherosclerosis refers to the build-up of plaque composed of cholesterol, fatty deposits, calcium and other substances in the arterial walls. Over time, this accumulation restricts blood flow to the extremities, leading to various complications. In saying this, the development of PAD is closely associated with the pathogenesis of atherosclerosis.

Similarly, the pathogenesis of diabetes involves various factors. In type 1 diabetes, an autoimmune response destroys the insulin-producing cells in the pancreas, leading to a complete lack of insulin production. On the other hand, type 2 diabetes, which accounts for the majority of cases, develops due to a combination of genetic predisposition, sedentary lifestyle, poor dietary habits and obesity. In this condition, the body becomes resistant to insulin, resulting in inadequate glucose uptake by the cells. Consequently, this leads to the characteristic high blood glucose levels in DM.

In the case of diabetes, high blood glucose levels contribute to the formation and progression of atherosclerotic plaques. Diabetes affects the integrity of blood vessels, causing damage to the inner lining, which facilitates plaque formation. Additionally, diabetes-induced inflammation and oxidative stress further accelerate atherosclerosis, aggravating the narrowing of arteries.

What are the risk factors for PAD and DM?

Several risk factors contribute to the development of PAD, including:

- **Diabetes:** Individuals with diabetes are at a higher risk of developing PAD due to the detrimental effects of high glucose levels on blood vessels.
 - **Smoking:** Tobacco use damages the arterial walls and accelerates the progression of atherosclerosis.
 - **Hypertension:** High blood pressure increases the strain on blood vessels, promoting arterial damage.
 - **High Cholesterol:** Elevated levels of cholesterol in the blood contribute to the formation of atherosclerotic plaques.
 - **Age and family history:** Advanced age and a family history of PAD increases the risk of developing the condition.
- Likewise, various risk factors contribute to the development of diabetes mellitus, including:
- **Obesity:** Excess body weight, particularly abdominal obesity, increases the risk of developing type 2 diabetes.
 - **Sedentary lifestyle:** Lack of physical activity and a sedentary lifestyle contribute to insulin resistance and the development of diabetes.
 - **Family history:** Having a family history of diabetes increases the risk of developing the condition.
 - **Age:** The risk of type 2 diabetes increases with age, especially after 45 years.
 - **Gestational diabetes:** Women who have had gestational diabetes during pregnancy have a higher risk of developing type 2 diabetes later in life.

What are the signs and symptoms of PAD and DM?

PAD often presents with symptoms that primarily affect the lower extremities. Intermittent claudication is one of the cardinal signs of PAD. This is the presence of pain, cramping or fatigue in the legs during physical activity, which subsides with rest. There is also leg numbness or weakness with reduced sensation. Furthermore, slow wound healing such as ulcers or sores on the legs or feet that heal at a slower rate than usual is another feature. Pale or bluish discoloration of the legs or feet together with diminished or absent pulse in the affected limb and cold extremities are other signs for PAD too.

As indicated, PAD can lead to several complications, especially when coupled with diabetes. The restricted blood flow caused by PAD increases the risk of developing:

- **Non-healing ulcers:** Reduced blood supply to the legs and feet can result in chronic wounds that are difficult to heal.
- **Infections:** Poor circulation impairs the body's ability to



fight infections, increasing the likelihood of severe infections like gangrene.

- **Critical Limb Ischemia:** This is a severe form of PAD.

By appreciating the increased risk for PAD when having DM too, it is also important to identify and understand the signs and symptoms of DM to prevent disease progression and complications. Some of the symptoms of DM are increased frequency of urination, increased thirst and appetite, unexplained weight loss in some cases despite increase food intake, fatigue, impaired vision and diminished wound healing. Unfortunately, diabetes not only increases the risk of developing PAD but also other cardiovascular diseases like heart attacks and stroke. It can also lead to neuropathy since high blood glucose levels can damage the nerves, leading to peripheral neuropathy, resulting in symptoms such as numbness, tingling or pain in the extremities. Furthermore, DM can also cause progressive kidney disease, diabetic retinopathy which can result in loss of vision as well as foot problems like toe ulcers which can sadly result in amputations.

The three ways PAD may present

PAD can manifest in different ways depending on its severity and progression. The presentation of PAD can be broadly categorised into three main stages: chronic, acute and critical. Each stage has distinct characteristics and varying levels of symptom severity.

Chronic PAD is the most common form and develops gradually over time. It is characterised

by the progressive narrowing of the arteries, typically in the legs. In the early stages, individuals with chronic PAD may not experience noticeable symptoms. However, as the disease advances, symptoms may arise. Intermittent claudication is the hallmark symptom of chronic PAD. It typically follows a predictable pattern, with pain occurring after walking a certain distance and improving with rest. Reduced sensation or weakness in the legs may be experienced, especially in more advanced cases of chronic PAD. Moreover, poor wound healing, diminished temperature and a pale discoloration of the affected limb usually occurs too.

Secondly, acute limb ischemia is a sudden and severe form of PAD that occurs due to a complete blockage of an artery, usually caused by a blood clot (thrombus) or embolus. It requires urgent medical attention as it can result in tissue damage or limb loss if not promptly treated. Symptoms of acute limb ischemia include severe intense and continuous pain in the affected limb together with absent pulses, pallor and coolness as well as weakness in that limb.

Finally, critical limb ischemia is the most severe stage of PAD and is characterised by severe blockages and compromised blood flow to the lower extremities. It is associated with significant pain at rest and tissue damage. Some of the symptoms one may experience include rest pain. Rest pain is intense, continuous pain in the legs or feet, even when at rest, which may worsen at night or when lying down. Chronic wounds or ulcers, usually on the legs or feet, weakness in the limb and possi-

ble gangrene, may also occur.

A final note

The evident connection between PAD and DM highlights the significant risk of poor wound healing, leading to the unfortunate development of toe ulcers. The combination of reduced blood flow in PAD and impaired sensation and healing in DM poses a serious threat to foot health. However, there are essential preventive measures and care strategies that individuals can implement to mitigate these risks.

To prevent and care for toe ulcers, regular foot care should be a priority. Daily foot inspections, maintaining cleanliness and dryness, and proper toenail care are vital in preventing injuries and infections. Additionally, wearing well-fitting and supportive footwear can reduce friction and pressure on the feet. Consistent blood glucose control through regular monitoring, adhering to prescribed medications and adopting a balanced diet are fundamental to managing diabetes effectively.

For those who experience symptoms consistent with PAD or DM, seeking prompt medical attention is crucial. Early diagnosis and intervention can prevent complications, including toe ulcers and potential amputations. Furthermore, leading a healthy and active lifestyle is essential in preventing the development of PAD and DM in the first place. Incorporating regular physical activity, such as walking, cycling or swimming, can improve circulation and overall cardiovascular health. Adopting a balanced diet rich in fruit, vegetables and whole grains, while limiting sugary and processed foods, can aid in maintaining optimal blood glucose levels and body weight.

In conclusion, taking proactive steps to prevent and manage PAD and DM is crucial for preserving overall health. By prioritising foot care, seeking timely medical attention, reducing smoking and leading a healthy lifestyle, individuals can significantly reduce the risk of developing such diseases and their associated complications. Remember, taking charge of your health today can positively shape your tomorrow, empowering you to embrace life with vitality and resilience.

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