# Prevalence of Significant Carotid Artery Stenosis in Patients with Significant Atherosclerotic Peripheral Arterial Disease

*Thesis*

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بسم الله الرحمن الرحيم
وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ
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**Ayah Abd El Wahab Ramzy**

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# List of Abbreviations

| Abb. | Full term |
|---|---|
| **A-II** | Angiotensin II |
| **AAA** | Abdominal Aortic Aneurysm |
| **ABI** | Ankle Brachial Index |
| **ACAS** | Asymptomatic Carotid Artery Stenosis |
| **ADA** | American Diabetes Association |
| **CABG** | Coronary artery bypass grafting |
| **CAD** | Coronary artery disease |
| **CAS** | Carotid Artery Stenosis |
| **CCA** | Common Carotid Artery |
| **CEA** | Carotid End Arterectomy |
| **COD** | Carotid Occlusive Disease |
| **CRP** | C-Reactive Protein |
| **CT** | Computed Tomography |
| **CTA** | Computed Tomography angiography |
| **CUS** | Carotid Ultra Sound |
| **DM** | Diabetes Mellitus |
| **DUS** | Duplex Ultra Sound |
| **EDV** | End Diastolic Velocity |
| **EDRF** | Endothelium-derived relaxing factor |
| **ESC** | European Society of Cardiology |
| **FH** | Family History |
| **HDL** | High density lipoprotein |

# List of Abbreviations (Cont...)

| Abb. | Full term |
|---|---|

**HTN**.....Hypertension
**ICA** .....Internal Carotid Artery
**IHD** .....Ischemic Heart Disease
**IMT**.....Intima Media Thickness
**LDL** .....Low density lipoprotein
**MI** .....Myocardial Infarction
**MRA**.....Magnetic resonance angiography
**MRI** .....Magnetic Resonance Imaging
**PA** .....Peripheral Angiography
**PAD** .....Peripheral Arterial Disease
**PSV** .....Peak Systolic Velocity
**PVD** .....Peripheral Vascular Disease
**S.Cr**.....Serum Creatinine
**SD**.....Standard Deviation
**SMCS**.....smooth muscle cells
**TGs** .....Triglycerides
**TIA**.....Transient Ischemic Attack

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# Introduction

Peripheral artery disease (PAD) is a progressive disease occurring as a result of atherosclerosis in the arterial system.

Peripheral arterial disease (PAD) comprises those entities which result in obstruction to blood flow in the arteries, exclusive of the coronary.

The definition of PAD technically includes problems within the carotid circulation, the upper extremity arteries, and the mesenteric and renal circulation[(1)], we will focus on chronic arterial occlusive disease in the arteries to the legs.

Atherosclerosis in the peripheral arteries is a chronic, slowly developing condition causing narrowing of the arteries. Depending on the degree of narrowing at each vascular site, a range of severity of symptoms may occur, while many patients will remain asymptomatic throughout their life. [(1)]

Occasionally acute events occur, often associated with thrombosis and/or embolism and/or occlusion of a major artery.

The diagnosis of PAD is difficult as most patients remain asymptomatic for many years. Symptoms do not present until there is at least 50% narrowing of an artery.

Since atherosclerosis is a systemic disease, physicians must appreciate the importance of detecting atherosclerosis in other vascular beds in order to establish the correct treatment to prevent organ damage.

As shown recently by the Reduction of Atherothrombosis for Continued Health (REACH) Registry, a substantial percentage of patients with chronic CAD have associated cerebrovascular disease, lower extremity artery disease (LEAD), or both.[2]

Given the common aetiology of peripheral atherosclerosis occurring at different vascular sites, the presence of disease at one site increases the frequency of symptomatic and asymptomatic disease at another. Peripheral arterial disease (PAD) and carotid occlusive disease (COD) are both known to be specific manifestations of atherosclerosis. Because they both have a common cause, it is reasonable to hypothesize that they should correlate with each other to a certain extent, and previous studies have shown that there is a correlation between the prevalence of PAD and COD.[3]

Carotid occlusive disease is usually caused by an atherosclerotic process and is one of the major causes of stroke and transient ischemic attack (TIA) [4]. Ischaemic stroke has a major public health impact as the first cause of long-term disability and the third leading cause of death.

Large artery atherosclerosis, and specifically internal carotid artery stenosis, accounts for ~20% of all ischaemic strokes.[5] In the vast majority of cases, carotid artery stenosis is caused by atherosclerosis.

Carotid stenosis is usually diagnosed by color flow duplex ultrasound scan of the carotid arteries. Early detection of carotid occlusive disease will help in controlling cerebrovascular events as For each 10% increase in the degree of carotid stenosis, the risk of having a cerebrovascular event increased by 26%.[6]

The association between manifestations of atherosclerotic disease in various arterial beds has been evaluated in numerous studies employing several types of study design. The rationale for expecting a correlation among different arterial beds is the systemic nature of atherosclerosis. Specifically, peripheral arterial disease (PAD) and carotid occlusive

disease (COD) have been evaluated to determine how they correlate with each other and with other manifestations of atherosclerosis. [7]

Carotid duplex ultrasonography (DUS) is well tolerated by all patients, and so it can be a useful diagnostic tool for assessing the stages of atherosclerosis.

# Aim of the Work

The aim of the study is to detect the prevalence of significant carotid artery stenosis in patients with significant atherosclerotic peripheral arterial disease underwent peripheral angiography, using carotid duplex ultrasonography.