



# Prevalence of Peripheral Arterial Disease in a Primary Health Care Area Cerro Municipality

Zamora JLC<sup>1\*</sup> and Del Risco SG<sup>2</sup>

<sup>1</sup>Master in Atherosclerosis, National Institute of Angiology and Vascular Surgery, Cuba

<sup>2</sup>1st Degree Specialists in Angiology and Vascular Surgery, National Institute of Angiology and Vascular Surgery, Cuba

\*Corresponding author: Jose Luis Cabrera Zamora, Master in Atherosclerosis, 2nd Degree

Specialist in Angiology and Vascular Surgery, National Institute of Angiology and Vascular Surgery, Havana, Cuba, Email: czamora@infomed.sld.cu

## Review Article

Volume 8 Issue 1

Received Date: December 05, 2023

Published Date: January 22, 2024

DOI: 10.23880/oajc-16000196

## Abstract

**Summary:** Cardiovascular diseases are the most important cause of death in subjects over 50 years of age in developed countries. Arterial pathology as a whole, whether presented as coronary, cerebrovascular, or peripheral arterial disease, is an important cause of chronic disease, functional limitation and decreased quality of life and is associated with greater general and specific morbidity.

**Objectives:** Estimate the prevalence of peripheral arterial disease in its initial stages and the associated classic risk factors in a population from the primary health care area of the Cerro Municipality.

**Material and Methods:** Population-based, prospective, longitudinal and cross-sectional, the study population included all subjects over 55 years of age, belonging to the Cerro Polyclinic who attended Angiology and Vascular Surgery consultation, in the period from 2012 to 2013. Of the 962 subjects treated, 707 were over 55 years old and of these, 94 met the inclusion criteria for the study. All of them knew the epidemiological purpose of the study and gave their consent.

**Results:** 94 patients over 55 years of age participated in the study, with a prevalence at the time of inclusion of 13% diagnosed with PAD in its initial Fontaine stages.

**Conclusions:** The prevalence of PAD, in its initial stages, was 13%, with 73.4% being asymptomatic and 27.6% symptomatic, the main risk factor being smoking with 57.5%, followed by Hypercholesterolemia and arterial hypertension, the association was confirmed with its location in other vascular beds, 14.9% in patients who had previously presented coronary events, 8.5% cerebrovascular events.

**Keywords:** Peripheral Arterial Disease; Cardiovascular Risk Factors; Intermittent Arterial Claudication during Gait; Open and/or Closed

**Abbreviations:** JNC: Joan National Committee; BMI: Body Mass Index; AMI: Acute Myocardial Infarction; CVD: Cerebrovascular Disease; TIA: Transient Ischemic Attack.

## Introduction

Cardiovascular diseases are the most important cause of death in subjects over 50 years of age in developed countries.

Arterial pathology as a whole, whether it presents as coronary, cerebrovascular or peripheral arterial disease, is an important cause of chronic disease, functional limitation and decreased quality of life and is associated with greater general and specific mortality. In addition, Arterial occlusive disease of the lower limbs, commonly known as peripheral arterial disease, generates dysfunction in the lower limbs, which can even lead to amputation. The resulting dependency and associated morbidity and mortality generate a great economic and social burden on these populations [1-4]. The silent nature of PAD, together with the increasing age of the population and the increasing incidence of risk factors, leads us to think that it may become one of the most serious diseases of the 19th century. Although the prevalence of PAD in the primary health care setting is high, it is commonly diagnosed. This occurs because many doctors do not obtain a history relevant to PAD and often miss subtle signs of the disease during the physical examination [5-8]. It is important for adequate planning of resources to know the distribution of peripheral arterial disease in our environment, its impact on the population, the factors that predispose to its development and the relationship that exists with atherosclerotic disease at other levels of circulation [9-12].

The epidemiological studies carried out in our population regarding PAD, in its initial stages, are scarce, which is why this research was carried out. Given the high prevalence of PAD, its high morbidity and mortality, and the expense incurred by both health institutions and the quality of life of patients who suffer from it, primary prevention of this constitutes a great challenge for our country [13-15]. For good planning of resources and prevention of PAD, in its initial stages it is necessary to know the population groups at greatest risk of suffering from this disease, being able to act directly on this population in the phase where the disease is practically benign and can be changed the course of the disease for the well-being of the patient [16]. Prospective population studies allow us to know the true reality of the prevalence and incidence of this disease and the factors that are associated with its appearance and progression. It is necessary, due to the great economic impact that this disease brings in its final stages to our country, to identify new factors that can be combined with the classic ones to improve the early diagnosis of the disease and thus improve the patient's life prognosis [17-19]. On the other hand, by making an early diagnosis of PAD, of the lower limbs, secondary prevention can be carried out, and influence the morbidity and mortality due to coronary and/or cerebrovascular disease, associated with the high rates of major amputations and death in occasions that suffer patients with PAD, in its most advanced stages (critical ischemia) [20-24]. In Cuba it is a poorly studied field, there are few prospective population publications that show the prevalence of PAD, lower limbs, almost all are hospital retrospectives and in advanced stages

of the disease, which is when the patient is at risk of suffering. A major amputation, otherwise a revascularization surgery procedure is performed. The population studied in this thesis allows us to know the prevalence of PAD in Primary Health Care and the main risk factors associated with its development [25-29].

## Material and Methods

A population-based, prospective, longitudinal and cross-sectional study was carried out, which included all subjects over 55 years of age, belonging to the Cerro Polyclinic who attended Angiology and Vascular Surgery consultation in the year 2012-2013. Of the 962 subjects treated, 707 they were over 55 years old and of these, 94 subjects met the inclusion criteria for the study and gave their consent. In all patients, an interview was performed, a vascular physical examination was performed, height was measured, and ITB was performed. Patients who were diagnosed with lower limb PAD in Fontaine stages I, II had the general data form filled out, and cholesterol, triglycerides, and fasting blood glucose were indicated in the INACV clinical laboratory. In turn, all patients were given an appointment again to the Angiology consultation of the Polyclinic.

### Inclusion Criteria

Patients over 55 years of age who, at the first consultation during the interrogation, physical examination and ABI less than 0.9, demonstrate PAD in its initial stages, according to the Fontaine classification or Stages IIa, IIb, and who give their consent to participate in the investigation. Stage IIa. Intermittent open arterial claudication: When pain when walking appears at a distance greater than 200 meters. Stage IIb: Intermittent closed arterial claudication: When pain when walking appears at a distance of less than 200 meters.

### Exclusion Criteria

PAD of the lower limbs stages III, IV (according to the Fontaine clinical classification. Patients with a history of peripheral, cerebral and/or coronary atherothrombotic events, with sequelae and disability. Patients with non-cardiovascular diseases in the terminal stage. COPD. End-stage chronic kidney failure. Chronic anemia. Dementia or psychiatric disorders that prevent the execution of the psychological tests.

### Variables

Through a personal interview, clinical variables and classic risk factors were determined at the time of inclusion.

- **Age:** Years at the time of inclusion. Tobacco Exposure. The WHO-MONICA questionnaire was used, which included the age at which smoking began, pack years and

current status (smoker-ex-smoker). To calculate pack years, the years of consumption were multiplied by pack-days consumed. Only subjects who had not smoked for more than 1 year were considered ex-smokers. Alcohol Consumption. Alcohol consumption was recorded in (gr-days or gr-weeks, depending on the form of exposure to this habit) by questioning the patient.

- **Arterial Hypertension:** Defined by the criteria of the FIT Joan National Committee (JNC) 94.
- **Diabetes Mellitus:** Basal glycemia was determined in all cases. Diabetes mellitus was defined according to World Health Organization 95 criteria or in case of taking antihypertensive medication.
- **Hypercholesterolemia-Hypertriglyceridemia:** Plasma values of total cholesterol and triglycerides were obtained by standardized methods in all subjects. In all subjects receiving lipid-lowering medication. BMI (body mass index). Body mass index was calculated with the Quetelet formula (weight in kilograms between the calculation of height). Previous history of vascular disease. It is collected in the anamnesis addressed to the patient. We have defined ischemic heart disease as a history of angina, acute myocardial infarction (AMI), or coronary revascularization (percutaneous or open); and cerebrovascular disease (CVD) such as previous

episodes of transient ischemic attack (TIA) or stroke.

- **Peripheral Arterial Disease:** Peripheral arterial disease was diagnosed with history, vascular physical examination, and ankle-brachial index. The determination was made in the first consultation and was later confirmed at the INACV, with more trained personnel. For the ABI assessment, the patient should not perform any exercises in the last 15 minutes and should rest in a supine position for at least 5 minutes before the measurement. For the measurements, a conventional blood pressure determination cuff was used, and a continuous Doppler device (Hadeco, Minidop) with an 8MHz probe. The posterior tibial and pedis arteries of both lower limbs were assessed using the highest value between them as a control for calculating the ABI. Diagnosis of PAD, an ABI value  $\leq 0.9$  indicated the existence of PAD despite the clinical manifestations. History of mother and father pathological family history of atherosclerosis in any vascular territory.
- **Cardiovascular Disease:** It is collected in the patient's interrogation as well as in their medical history from the family doctor's office. Brain Vascular Disease. It is collected in the form of the first consultation. Peripheral arterial disease. It is collected in the anamnesis of the first consultation (Table 1).

	PAD in early stages (n= 94)) (n=%)
Age	65,13
Non smoker	1(1,1)
Former smoker	39(49,5)
Active Smoker	54(57,5)
Alcohol Consumption (gr/d)	22,78
Arterial hypertension	66(70,2)
Mellitus diabetes	35(37,2)
Cholesterol Major 5 mmol/l	71(75,5)
Triglycerides Greater than 1.7 mmol/l	36(38,3)
BMI	27,32
Schemic heart disease	14(14,9)
Cerebrovascular event	8(5)

**Table 1:** Classic risk factors in the study population.

### Ethics

The patients were explained the importance of participating in the study and how it can help other patients who suffer from this disease, being free to participate in the research, all information obtained during the consultations was respected. The doctor had the obligation to maintain the reliability of his data during and after the investigation was completed. This research was carried out respecting the

four ethical principles. Respect for people, beneficence, non-maleficence and justice.

### Statistical Analysis

A database was created with the qualitative and quantitative results; the results were evaluated with an SPSS statistical package. Prevalence of PAD, in its initial stages. The PAD was calculated in raw percentages (ratio) of the

total population studied as well as the prevalence of each risk factor at the start of the study.

## Results

94 patients over 55 years of age participated in the study, for a prevalence at the time of inclusion of 13%, diagnosed with PAD in its initial stages of Fontaine, who belong to the Cerro Polyclinic. 70 men and 24 women were diagnosed, with males predominating 3:1 for 74% and 25% respectively. The age group with the most patients was those over 66 years of age with a number of 30 (42.2%) men and 14 (12%) women. Of the 94 patients studied, 25 (26%) were asymptomatic, 20 men and 5 women, and there was a predominance of closed claudication. Among the classic risk factors that predominated was active smoking with 54 (57.4%) patients, followed by previous smoking 39 (49.5%) also had arterial hypertension 66 (70.2%), and hypocholesterolemia 71 (75.5%), of the total number of patients, 14 (14.9%) and 8 (8.5%) had a history of coronary artery disease (14.9%). Of the patients, only 15 (15.9%) had a family history of ischemic heart disease and the majority did not have a family history of atherosclerotic disease in other vascular territories 72 (76%).

## Discussion

The prevalence found in our environment was 13.4% with a 3:1 predominance of males. Previous epidemiological studies show similarity although they have been carried out in different settings Edinburgh Artery Study showed a prevalence of 16.6% for asymptomatic subjects and 4.5% for symptomatic subjects in the same age group as our study. Others Diehm, et al. 15.6%, Rotterdam Study 16.1% over 55 years old. PARTNERS higher prevalence (29%). Risk factors, only age, sex and smoking habit show a direct association with symptomatic PAD, it has a ratio of 3:1 (76% total) and is not related to previous population studies. Family pathological history does not show a relationship with PAD. Only ischemic heart disease shows a slight relationship.

## Conclusions

The prevalence of PAD of the lower limbs in the initial stages was 13%, with 73.4% of patients being symptomatic and 27.6% asymptomatic. Smoking was found to be the main risk factor, with 57.5% also being associated with hypocholesterolemia and arterial hypertension. The predominant age group was over 66 years of age with 40 patients for 44.6%. It was confirmed that PAD, in its initial stages, is related to atherothrombotic events in other vascular territories; 14 (14.9%) patients had presented previous coronary events, and 8 (8.5%) had cerebrovascular disease. PAD was not associated with a family history

of atherosclerosis because the majority of patients 72 (76%) had no history of PAD, ischemic heart disease, or cerebrovascular event.

## References

1. Creager MA (2020) A Bon VOYAGER for Peripheral Artery Disease. *N Engl J Med* 382(21): 2047-2048.
2. Nordanstig J, Behrendt CA, Bradbury AW, De Borst GJ, Fowkes F, et al. (2023) Peripheral arterial disease (PAD) - A challenging manifestation of atherosclerosis. *Prev Med* 171: 107489.
3. Bolaños Martínez I, Chaves Chaves A, Gallón Vanegas L, Ibáñez Morera M, López Barquero H (2019) Enfermedad Arterial Periférica en Miembros Inferiores. *Revista Medicina Legal Costa Rica* 36(1): 85-90.
4. Álvarez Prats M, Triana Mantilla ME, Rodríguez Villalonga LE, Ramos Morales LE, Arpajón Peña Y (2021) Screening for peripheral arterial disease of the lower limbs in people over 50 years of age. *Rev Cubana Angiol Cir Vasc* 22(1): e296.
5. Chao Paredes JM, Rodríguez Allende MA, Martínez Rodríguez M, Dehesa Gallo G, Ferrer Arrocha M, et al. (2020) Arterial disease of the lower limbs detected by Doppler ultrasound in asymptomatic patients. *Cuban Medical Magazine* 59(4): e1366.
6. Daza Reatiga WDJ (2020) Isquemia Crónica Amenazante de Miembros Inferiores. *Intervenciones y Desenlaces. Trabajo de Grado para Optar por el Título de Especialista en Cirugía Vascular y Angiología. Bogotá. Colombia. Fundación Cardiol infantil. Instituto de Cardiología. Universidad Nuestra Señora del Rosario.*
7. Puras-Mallagray E, Cairols-Castellote MA, Vaquero-Morillo F (2006) Estudio piloto de prevalencia de la enfermedad arterial periférica en atención primaria. *Angiología* 58(2): 119-125.
8. Vidal-Barraquer Mayol F (2010) Peripheral arterial disease: A disease of the 21st century? *Angiology and Vascular Surgery Service. J Vasc Surg* 132(2): 645-647.
9. Bravo Ruiz E, Vega de Ceniga M, Izaguirre Loroño M, Casco Aguilar C, Estallo Laliena L, et al. (2010) Cardiovascular risk factors in chronic lower extremity ischemia: Importance of vascular surgeon intervention. *Angiology* 62(1): 3-8.
10. Norgen L, Hiatt WR, Dormandy JA, Nehler MR, Hams KA, et al. (2007) Inter-Society Consensus for the management of peripheral arterial diseases. (TASC.II). *J*

Vasc Surg 45: 55-67.

11. Bhatt DL, Steg PG, Ohman EM, Hirsch AT, Ikeda Y, et al. (2006) International prevalence recognition, and treatment of cardiovascular risk factors in outpatient with Atherothrombosis. *JAMA* 295(2): 180-189.
12. Compres E, López R, Wehbe M, Sánchez J, Butler M (2016) Prevalencia de enfermedad arterial periférica asintomática según factores de riesgo cardiovascular. *Ann Med PUCMM* 6(1): 1-15.
13. Tranche-Iparraguirre S, Marin-Iranzo R, Fernández-de Sanmamed R, Riesgo-García A, et al. (2012) Peripheral arterial disease and kidney failure: a common association. *Nephrology* 32(3): 313-320.
14. De Luis-Román DA, Fernández-Ovalle H, Almaraz-Gómez A, Romero A (2006) Descripción de los factores de riesgo cardiovascular de una muestra de pacientes con isquemia crítica de miembros inferiores. *Angiología* 58(5): 357-368.
15. Pichín Quesada A, Goulet Ordaz L, Suárez Lescay C, Franco Mora MA (2017) Patients with ischemic heart disease and asymptomatic peripheral arterial disease determined by the ankle-brachial index. *Medisan* 21(1): 1-11.
16. Emdin CA, Anderson SG, Callender T, Conrad N, Salimi-Khorshidi G, et al. (2015) Usual blood pressure peripheral arterial disease and vascular risk cohort study of 4.2 million adult. *BMJ* 351: h4865.
17. Vidula H, Liu k, Criqui MH, Szklo M, Alison M, et al. (2015) Metabolic syndrome and incident peripheral arterial disease-the mult-ethnic study of atherosclerosis. *Atherosclerosis* 243(1): 198-203.
18. Alahdad F, Wang AT, Elralyah TA (2015) A systematic review for the screening for peripheral arterial disease in asymptomatic patients. *J Vasc Surg* 61(3): 42-53.
19. Criqui MH, Aboyans V (2015) Epidemiology of peripheral artery disease. *Circ Res* 116(9): 1509-1526.
20. Diehn C, Lange S, Darius H, Pittrow D, Von Stritzky, et al. (2011) Association of low ankle brachial index with high mortality in primary care. *Eur Heart J* 27(14): 1743-1749.
21. (1993) The fifth report of the joint National Committee on Detection, Evaluation, and treatment of High Blood Pressure (JNCV). *Arch Inter Med* 153(2): 154-183.
22. (1985) Diabetes mellitus, Report of WHO Study. *World Health Organ Tech Rep Ser* 727: 1-113.
23. Basyouni MW, Shabana AM, El Kilani WM (2018) Prevalence of lower extremities peripheral arterial disease among Egyptian ischemic patients attending cardiac rehabilitation unit. *Egyptian Heart J* 70(4): 295-299.
24. Cordero A, Morillas P, Bertomeu-González V, Quiles J, Soria F, et al. (2011) Pathological ankle-brachial index is equivalent of advanced age in acute coronary syndromes. *Eur J Clin Invest* 41(12): 1268-1274.
25. Alves-Cabrato L, García-Gil M, Comas-Cufi M, Blanch J, Ponjoan A, et al. (2019) Role of low ankle-brachial index in cardiovascular and mortality risk compared with major risk conditions. *J Clin Med* 8(6): 870.
26. Arroyo-Rodríguez C, Brito-Zurita OR, Sandoval-Navarrete S, Solis-Vasquez R, Ornelas-Aguirre JM, et al. (2018) Risk factors for three-vessel coronary artery disease in patients of Northwest México. *Arch Cardiol México* 88(5): 423-431.
27. Ohman EM, Bhatt DL, Steg G, Goto S, Hirsch AT, et al. (2006) The reduction of atherothrombosis for continued Health (REACH) registry: An international, prospective, observational investigation in subjects at risk for atherothrombotic events-study design. *Am Heart J* 151(4): 786.e1-786.e10.
28. Nikolsky E, Mehran R, Mintz GS, Dangas GD, Lansky AJ, et al. (2004) Impact of symptomatic peripheral arterial disease on 1-year mortality in patients undergoing percutaneous coronary interventions. *J Endovasc Ther* 11(1): 60-70.
29. Narins CR, Zareba W, Moss AJ, Marder VJ, Ridker PM, et al. (2020) Relationship between intermittent claudication, inflammation thrombosis, and recurrent cardiac events among survivors of myocardial infarction. *Arch Intern Med* 164(4): 440-446.

