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Evaluation of Asymptomatic Lower Limb Obliterating Arteriopathy and Associated Cardiovascular Risk Factors in the Senegalese Population Using the Systolic Pressure Index Method

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ABSTRACT

Lower limb arterial disease or Peripheral artery disease (PAD) is not mentioned as much as other well-known cardiovascular diseases such as coronary heart disease or accidents cerebral vascular. But PAD nevertheless remains an important indicator of cardiovascular health in general. Unfortunately, many patients with PAD go undiagnosed. Thus, the objective of this study was to determine the prevalence of obliterating arteriopathy of the lower limbs and its associated factors in the Senegalese rural population.

Methods: This was a cross-sectional, descriptive, and analytical study carried out between November 6 and 11, 2019 in Widou Thiengoly a rural area of Senegal, in subjects aged 15 and over. The Global Physical Activity Questionnaire was used to determine physical activity practice and sedentary behavior. Systolic pressure index (SPI) was measured as the ratio of ankle blood pressure (BP) to brachial BP (BBP). PAD was defined by an SPI less than 0.9 and mediacalcosis by an SPI greater than 1.3. A sedentary lifestyle was defined by the absence of daily physical activity or physical activity lasting less than 150 minutes per week. As for arterial hypertension, it was defined for a systolic BP ≥ 140mm Hg and/or ≥ 90mm Hg.

Results: Subjects had a mean age of 45 ± 15.9 years and 41% were women. Cardiovascular risk factors were high blood pressure (43.3%), pre-obesity and obesity (12.2% and 3.3% respectively), and a sedentary lifestyle (26.7%). Approximately 6.7% of the subjects surveyed had PAD and 7.8% had mediacalcosis. PAD was more common in women 10.8% [95% CI: 1.04-12.75] compared to 3.8% [95% CI: 4.29-24.71] in men. However, mediacalcosis was more noted in men 11.3% compared to 2.7% of women. A statistically significant difference was noted between men and women (p = 0.004).

In addition, PAD was more common in those under 50 years of age (22.7%) and in overweight subjects (9.1%).

Conclusion: Although it is an integral part of atheromatous diseases, PAD is still underdiagnosed in the Senegalese population. Strategies for prevention and management of risk factors such as hypertension and a sedentary lifestyle must be put in place to reduce its incidence in the population at risk.

Keywords: Lower Limb Arterial Disease; Peripheral Artery Disease; Systolic Pressure Index; Hypertension; Cardiovascular Diseases

Abbreviations: PAD: Peripheral Arterial Disease; ABI: Ankle-Brachial Index; DRC: Democratic Republic of Congo; CAR: Central African Republic; IRL: International Research Laboratory; MET: Metabolic Equivalent of Task; SBP: Systolic Blood Pressure; DBP: Diastolic Blood Pressure; GPAQ: Global Physical Activity Questionnaire; CNRS: Committee for Health Research; BMI: Body mass index; MAP: Mean Arterial Pressure; GBD: Global Burden of Disease study; CI: Conversion Index; CVRF: Cardiovascular Risk Factors

Introduction

Cardiovascular diseases related to atherosclerosis are the leading cause of death in industrialized countries and more than 80% of these deaths occur in low- and middle-income countries [1]. Peripheral Arterial Disease (PAD) is associated with an increased risk of mortality and morbidity from cardiovascular or cerebrovascular causes [2]. Hypertension, diabetes, smoking, and dyslipidemia are the main risk factors for atherosclerosis, which is the most common etiology of peripheral arterial diseases [3,4]. In low- and middle-income countries in particular, environmental factors such as poverty, industrialization and infections could affect the risk of developing PAD [5]. It is estimated that more than 200 million people are affected by PAD worldwide. This prevalence has increased by about 25% between 2000 and 2010, especially in low- and middle-income countries [6]. Epidemiological data have shown a global prevalence of PAD ranging from 4.5 to 57% and from 10 to 50% in the African population [2,4,6,7]. Moreover, nearly two-thirds of the population with PAD has its asymptomatic form [4,5]. The prevalences of asymptomatic PAD in the world vary from 7 to 43%, and it remains very poorly diagnosed in the population in Sub-Saharan Africa, which demonstrates the importance of early systematic screening of the population at risk [8-10]. Atherosclerosis is a generalized and chronic process that occurs at the intima of large and medium caliber arteries of all organs and is characterized by the appearance of atheromatous plaques.

It consists of a local accumulation of lipids, complex carbohydrates, blood and blood products, fibrous tissue and calcium deposits accompanied by changes in the media. PAD is a form of atherosclerosis, characterized by partial or total obstruction of one or more arteries destined for the lower limbs. It is associated with a considerably increased risk of major cardiovascular events and death [5,6,11]. Moreover, it is an important cause of functional disability that affects the quality of life of the patient as it represents a risk of amputation of 5% to 25% in case of critical ischemia [12]. The early diagnosis of PAD is based on a simple and objective method, which can also detect the asymptomatic form, by measuring the Ankle-Brachial Index (ABI) [5,13]. This method is even more interesting since it has been shown that even in its asymptomatic form, PAD is associated with a high risk of cardiovascular accident [2,14,15]. ABI is the ratio of systolic pressure at the ankle to that at the arm. Its measurement has been standardized by a consensus document [14]. The main interest of this diagnostic method is its wide feasibility, its non-invasive nature, and its low cost, well suited for epidemiological studies and medical settings in Sub-Saharan African countries. An ABI < 0.90 is considered abnormal and indicates the presence of PAD, with a specificity of 97% and a sensitivity of 80% in the general population [14,15]. However, some elderly or diabetic and/or renal insufficient individuals (especially dialysis patients) may have very high ABI > 1.40, related to medial calcification.

This corresponds to the calcification of the medial layer of the arteries, making them progressively incompressible during the inflation of the cuff for the measurement of the ABI. Medial calcification is a distinct pathology from atherosclerosis, but may be associated with it, explaining why patients with ABI > 1.40 may also have PAD [14,16,17]. In Africa, there is very few epidemiological data on PAD available. However, some studies have reported a prevalence of 14.8% in the Democratic Republic of Congo (DRC) and 12.3% in the Central African Republic (CAR) [18], Bouaguel et al in 2019 reported a prevalence of PAD in Algeria of 12.1% [19] and the same prevalence (12.1%) was noted by Pessinaba in Senegal in the region of Saint-Louis [9]. However, in Senegal, data on PAD in the general population are still scarce, and the prevalence of cardiovascular diseases such as hypertension and diabetes are increasing sharply, especially in rural areas. Indeed, studies have reported prevalences of hypertension of 34.7% [20] and diabetes of 2.9% [21] in the northern region of Senegal. Hence the interest of this study, whose general objective was to screen for asymptomatic peripheral arterial disease of the lower limbs in the rural population of Ferlo, Senegal and secondarily to evaluate the factors associated with abnormalities of the systolic pressure index in this population.

Methodology

This was a descriptive cross-sectional study conducted in November 2019 in Widou Thiengoly in Ferlo, a semi-desert rural sylvo-pastoral area in northern Senegal. The data were collected during the consultation days organized by the Faculty of Medicine of Cheikh Anta Diop University in collaboration with the International Research Laboratory (IRL) 3189-Environment-Health-Society, CNRS-UCAD.

Study Population

The study involved adult subjects, aged 18 years and over, with no known history of PAD, living permanently in Widou Thiengoly and its

surroundings and having attended the health units during the consultation days. Subjects who did not meet the inclusion criteria, namely pregnant women and people who were unable to answer the questions, were not included in the study. The recruitment was exhaustive, following the respect of the selection criteria.

Studied Parameters

An investigation into the sociodemographic characteristics of the population was conducted using a questionnaire, followed by anthropometric (weight and height) and cardiovascular (systolic and diastolic blood pressures) measurements. The Global Physical Activity Questionnaire (GPAQ) was used to assess the physical activity and sedentary behavior of the study population. The body mass index (BMI) of the subjects was calculated using the Quetelet equation, BMI (kg/m^2) = Weight (kg) / Height (m^2). According to the BMI classification, overweight is defined as a BMI between 25.0 - 29.9 kg/m^2 and obesity for a BMI ≥ 30 kg/m^2. Blood pressure was measured in both arms of the subject in the supine position after a rest time of 10 to 15 minutes, in a room where the ambient temperature was around 30 ± 5°C using a validated Omron electronic sphygmomanometer. Hypertension is defined by the American Heart Association standards, by A Systolic Blood Pressure (SBP) ≥ 140 mmHg and/or a Diastolic Blood Pressure (DBP) ≥ 90 mmHg, or any subject on antihypertensive treatment even if their blood pressure under treatment is below the thresholds. The Ankle-Brachial Index (ABI) was calculated by the ratio of the Blood Pressure at the Ankle (BPA) over the brachial (BPB). A sphygmomanometer was used to measure the BPB and the BPA was obtained using a handheld doppler device (Diadop50) with a dual-frequency probe of 4 and 8 MHz. The measurement was performed at the level of the anterior tibial artery and the posterior tibial artery.

The highest BPB and the lowest BPA were used [16]. The ABI was considered normal when its value was between 0.9 and 1.3. Peripheral arterial disease (PAD) was defined by an ABI lower than 0.9 and medial calcinosis by an ABI higher than 1.3. PAD was classified as severe when the ABI was < 0.4; as poorly compensated if the ABI was between 0.4 and 0.75, and as compensated when the ABI was between 0.75 and 0.9. The GPAQ consists of 16 questions (P1-P16), allowing to collect information on sedentary behaviors and physical exercise in three situations: work or domestic activities, moving from one place to another and leisure activities. Physical activity can be defined as any body movement produced by the contraction of skeletal muscles resulting in an increase in energy expenditure above the resting expenditure. This energy expenditure is expressed in Metabolic Equivalent of Task (MET). Thus, three levels of physical activity are identified according to their intensity. Light physical activity < 3 METs, Moderate physical activity between 3 and 6 METs and Intense physical activity > 6 METs. A sedentary lifestyle was defined by the absence of daily physical activity or physical activity of less than 150 minutes per week.

Statistical Analysis

A database was created with Microsoft Excel version 365 software and then exported to STATA and Graph Pad 8 software for analysis. Qualitative data were expressed in terms of frequencies and percentages, quantitative data in means ± standard deviation Comparisons were made by non-parametric tests: Pearson's chi-square for comparison of proportions; ANOVA for comparison of means. A p-value < 0.05 was considered statistically significant for all analyses.

Ethical Aspects

The study received approval from the national ethics Committee for Health Research (CNRS). At the local level, health and territorial authorities were informed. Each subject eligible for the study was informed of the aims and objectives of the study and his/her informed and signed consent was obtained before enrollment.

Results

Sociodemographic Characteristics

A total of 90 subjects were enrolled, including 53 men (59%) with a male/female sex ratio of 1.43. More than half of the population (62.22% [95% CI: 51.9-71.5]) was under 50 years old. The extreme ages were 18 and 82 years with a mean of 45 ± 15.9 years. The median age was 43 years and the mode 35 years. The participants were mainly Fulani (76%), followed by Wolof (12.44%), Moors (4%) and other ethnic groups (7%). They were also mostly cattle breeders (97%), an activity mainly practiced by men and women were housewives.

Body Mass Index (BMI)

The mean BMI of the participants was 21.5 ± 5.01 kg/m^2 and it was identical in men (21.4 ± 5.5 kg/m^2) and women (21.6 ± 4.4 kg/m^2). More than 3/4 of the study population had a normal body weight 84.4% [95% CI: 43.1-63.3]. About 12.2% [95% CI: 06.9-20.5] and 3.3% [95% CI: 01.1-09.4] of the subjects were respectively overweight and obese. Moreover, 21.6% [95% CI: 11.4-37.2] of women were overweight, however no case of obesity was noted in this group. On the other hand, 5.7% [95% CI: 01.9-15.4] of obesity and overweight was observed in men (Table 1).

Table 1: Anthropometric and cardiovascular parameters of participants.

	MEN (N=53)	WOMEN (N=37)	Total (N=90)
BMI (Kg/m²)	21.4 ± 5.5	21.6 ± 4.4	21.5 ± 5.01
- Normal (%)	88.7	78.4	84.4
- Overweight (%)	5.7	21.6	12.2
- Obesity (%)	5.7	00.0	3.3
SBP (mmHg)	128.6 ±17.5	130.8 ±26.5	129.5 ± 21.6
DBP (mmHg)	82.9 ±10.1	85 ±15.9	83.8 ± 12.8
MAP (mmHg)	183.9 ±22.9	187.5 ±35.7	185.4 ± 28.7
- Normotensive	67.9	48.6	60.0
- Hypertensive	32.1	51.4	40.0

Blood Pressure

The Mean Arterial Pressure (MAP) of the respondents was 185.4 ± 28.7 mm Hg with a median of 176.7 mm Hg. The MAP was almost identical for men and women. The mean systolic blood pressure was 129.5 ± 21.6 mm Hg and a median of 122.3 mm Hg. The mean diastolic blood pressure was 83.8 ± 12.8 mm Hg and a median of 81.5 mm Hg (Table 1). The proportion of hypertensive subjects among the participants was 40.0% [95% CI: 30.6-50.6]. Women were more hypertensive (51.4%) than men (32.1%) with a statistically significant difference, p = 0.015.

Physical Activity

Most of the surveyed subjects reported practicing moderate to intense physical activity, 30% [95% CI: 21.5-40.1] and 43.3% [95% CI: 33.6-53.6] respectively. However, 26.7% [95% CI: 18.6-36.6] of the respondents had a sedentary behavior. Women were more sedentary 32.4% [95% CI: 19.6-48.5] versus 22.6% [95% CI: 13.4-35.5] for men (Figure 1). Indeed, men spent more time practicing physical activity ≥ 3h / week compared to women. Hypertension was more noted in sedentary people with 58.3% [95% CI: 38.8-75.5] of hypertensive subjects versus 38.5% [95% CI: 24.9-54.1] in subjects practicing intense PA and 37% [95% CI: 21.5-55.7] for moderate PA. A statistically significant difference was noted between those who practice physical activity and those with sedentary behavior; p = 0.0054.

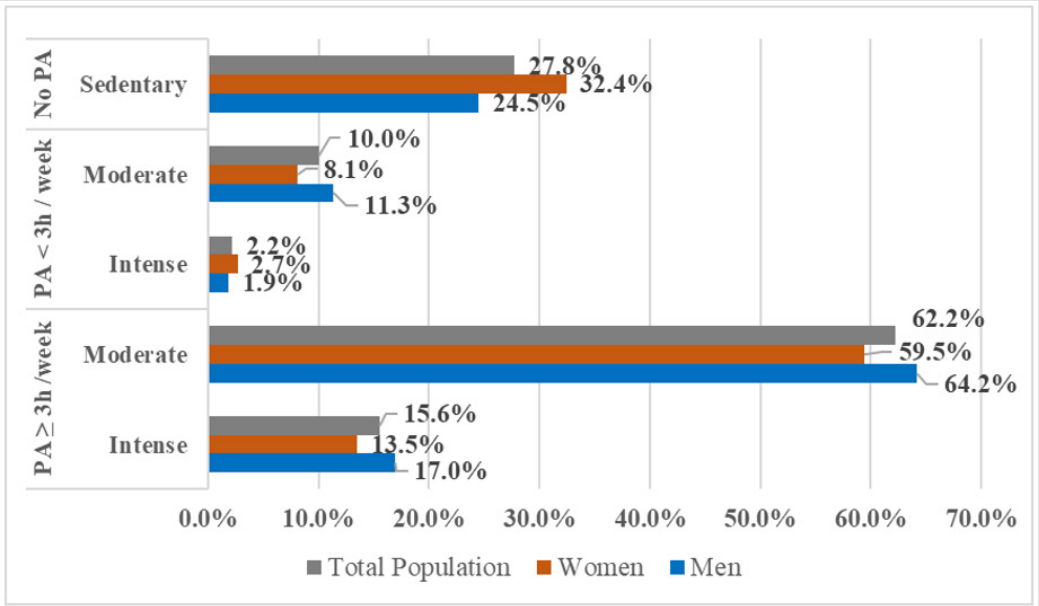

Figure 1: Distribution of subjects according to the weekly duration devoted to the practice of intense or moderate physical activities according to gender.

Peripheral Arterial Disease (PAD)

The mean ABI in the population was 1.09 ± 0.13 (range 0.71 and 1.48) and the median 1.09. About 14.4% of the population had an abnormal ABI. The ABI values obtained are shown in Table 2. PAD among the respondents was 6.6% [95% CI: 3.1-13.8] with 2.2% [95% CI: 0.6-7.7] of subjects who had poorly compensated PAD and 4.4% [95% CI: 1.7-10.8] who had compensated PAD. PAD was more frequent in subjects under 50 years of age with 8.9% [95% CI: 5.5-26.1] of cases (with a mean age of 35.3 ± 8 years) compared to 2.9% [95% CI: 0.4-10.5] in subjects over 50 years of age. It was higher in women with 10.8% [95% CI: 4.3-24.7] versus 3.8% [95% CI: 1.1-12.7] in men, without a statistically significant difference.

Table 2: Classification of Systolic Pressure Index values in the study population.

SPI	Percentage	95% Confidence Internal	Signification
< 0.4	0.0%	-	PAD with severe impact
0.4 ≤ SPI < 0.7	2.2%	0.6-7.7	PAD poorly compensated
0.7 ≤ SPI < 0.9	4.4%	1.7-10.8	PAD compensated
0.9 ≤ SPI ≤ 1.3	85.6%	76.8-91.4	Normal
SPI > 1.3	7.8%	3.8-15.2	Incompressible artery

Mediacalcosis

Mediacalcosis was noted in 7.8% [95% CI: 3.8-15.2] of subjects. Mediacalcosis was more present in the group of individuals over 50 years of age with 10% [95% CI: 4.4-21.4] of cases versus 5% [95% CI: 1.4-16.5] in subjects under 50 years of age. It was more noted in men with 11.3% [95% CI: 5.3-22.6] versus 2.7% [95% CI: 0.5-13.8] in women, with a statistically significant difference p = 0.049.

Associated Risk Factors

PAD and HBP: Among subjects with PAD, 16.7% [95% CI: 03.0-56.4] and 42.9% [95% CI: 15.8-74.9] who had medial calcification were hypertensive. High blood pressure seems to be linked to the occurrence of PAD in this rural population of Ferlo, Senegal (p < 0.001) (Table 3).

Table 3: Risk factors associated with PAD.

Variables	Pad (%)	95% IC	Significant P < 0.05
Age			
18-49 Years	8.9	3.9-19.3	0.4026
50 years and over	2.9	0.5-14.9	
Sex			
men	3.8	1.1-12.7	1.1046
women	10.8	4.3-24.7	
bmi			
lean	7.1	1.9-22.6	0.3095
Normal	6.3	2.1-16.8	
overweight	9.1	1.6-37.7	
obesity	0	0	
physical activity			
Intense	7.7	2.6-20.3	0.4847
Moderate	7.4	2.1-23.4	
low	4.2	0.7-20.2	
Hbp			
Hypertension	16.7	3.0-56.4	< 0.0001
Non hypertension	83.3	43.6-96.9	

PAD and BMI: About 15.4% [95% CI: 04.3-42.2] of subjects with an abnormal ABI were overweight, but none were obese. Thus, 14.3% [95% CI: 02.6-51.3] of subjects with medial calcification and 16.7% [95% CI: 03.0-56.4] with PAD were overweight. There is no significant statistical difference between those who had a normal ABI and those with an abnormal ABI.

PAD and Sedentary Lifestyle: PAD was noted in 7.7% [95% CI: 2.6-20.3], 7.4% [95% CI: 2.1-23.4] and 4.2% [95% CI: 1.4-20.2] of subjects practicing respectively intense, moderate, and low or sedentary physical activity.

Discussion

Lower limb arterial occlusive disease is a marker of systemic atherosclerosis, and it is associated with an increased cardiovascular risk [22]. It is a common and underestimated disease because it remains asymptomatic for a long time. However, all studies show that there is no significant difference in terms of risk of death and vascular events at five years between symptomatic and asymptomatic patients [9]. The overall prevalence of PAD in our study is comparable to that reported in the Global Burden of Disease study (GBD) 2010 [6]. The prevalence of PAD in our study is lower than that described in Western countries. It was estimated at 6.6% in the general population of Widou. In the United States, the prevalence was 11.8% in 2012, 10.8% in Brazil in 2011, 8% in Great Britain, 3 to 10% in Germany and 11% in France in 2000 [23]. In Africa, in 2014, the prevalence of PAD was 14.8% in the Democratic Republic of Congo (DRC) and 12.3% in the Central African Republic (CAR) [24]. It is also lower than that reported by Pessinaba et al in the screening of asymptomatic PAD by ABI in an urban area of Senegal in Saint Louis, which was 12.1% [9]. This difference between the prevalences may be due to the size of our sample and/or the differences related to the category of population studied. Moreover, the main cardiovascular risk factors noted in our study were comparable to those found in other studies, notably hypertension, whose prevalence was 40.0%, sedentary lifestyle 26.7% and overweight and obesity 15.5%. This same high prevalence of risk factors was observed in the Saint Louis study with sedentary lifestyle at 76.4%, HTN at 68%, obesity at 32% and the presence of associated cardiovascular coronary disease [9]. Socio-economic disparities between urban and rural areas could explain the cardiovascular profile of subjects as well as the differences in prevalence between urban and rural areas in Senegal.

Peripheral Artery Disease (PAD) and Gender

In our study, PAD was much more marked in women 10.8% [95% CI: 4.3-24.7] versus 3.8% [95% CI: 1.1-12.7] in men. This result is consistent with many previous epidemiological studies, and follows the trend described in the Global Burden Disease 2010 [13]. This result is supported by the survey conducted by Pessinaba et al. who showed a female predominance [9]. The same was true for the study by B. NGELLE who found that PAD was more common in women (50%) than in men (17.8%) [25]. A recent analysis of the Global Burden Disease project highlighted that in 2010 in Sub-Saharan Africa, PAD affected more women than men [24]. This increase in the risk of PAD in women is attenuated after adjustment for confounding factors. These data could be explained by the slightly lower ABI in women, which would lead to an over-diagnosis of PAD [4]. However, there are studies that have found contradictory results. For example, Amine El Mansoumi (2016) found a male predominance in his thesis on the contribution of measuring the systolic pressure index using an automatic blood pressure monitor in preventive medicine in screening for lower limb occlusive arterial diseases [15].

PAD and AGE

It is well established that the cardiovascular risk increases with age and advanced age is considered as a factor independently linked to PAD in several studies. The study conducted at the emergency department of the Melbourne University Hospital showed that the prevalence of PAD increased significantly with age (25.7% [95% CI: 17.0-36.7]) [26]. The ELLIPSE study showed using a multivariate analysis that advanced age ≥ 81 years was an independent factor of PAD with an OR of 1.45 [27]. According to the American Society of Cardiology, based on a meta-analysis, age emerged as a powerful risk factor. Compared to subjects in the younger age category, octogenarians were about 12 times more likely to have PAD [28]. The results of these studies are different from what we found in our study. Indeed, we found that PAD was frequent in subjects under 50 years of age (8.9% [95% CI: 5.5-26.1]). However, there is a form of PAD in young adults under 50 years of age that accounted for 1 to 7% of lower limb arterial diseases in the general population [29]. Indeed, in our study the mean age of subjects with PAD was 35.3 ± 8 years. This result was supported by a study that involved 73 young individuals suffering from PAD whose mean age of onset of the disease was 38 ± 8 years [30]. PAD has some particuliarities when it occurs before 50 years of age.

There is a great diversity of causes, since, besides atherosclerosis which represents 2/3 of the cases and Buerger's disease which represents 1/4, other causes can be highlighted such as embolic cardiopathies, myeloproliferative syndromes, genetic causes, compressive causes, inflammatory arterial diseases, or antiphospholipid syndrome [22,30-32]. Despite variable results, PAD is a rather rare pathology in subjects under 50 years of age [29,32,33]. However, different methodological approaches could be the cause of the differences noted in the results. Moreover, in our study, the determination of the real age of the individuals interviewed posed a problem. This could explain the presence of PAD cases in young subjects of this rural Senegalese population.

PAD and Obesity

Nowadays, obesity is a public health problem in many populations. However, to date, the data from epidemiological studies on the role of obesity or overweight as a risk factor for PAD are inconsistent and controversial. In our sample, 3.3% of participants were obese,

while 12.2% were overweight. These results are lower than those found by Pessinaba et al. who were 59.9% for obesity/overweight [9] and were 60.71% for the Ngelle study [25]. In one of the largest studies in terms of sample size (10,059 Israeli men), Bowlin estimates an association with the conversion index with a RR of 1.24 [95% CI: 1.1 -1.5] for each increase of 5.0 kg/m^2 of the Body Mass Index (BMI) [34]. These results do not support our result because PAD is not associated with obesity. Nevertheless, three of the indexed studies and other studies in the general population support our result [3,7,13].

PAD and Hypertension (HTN)

We noted a prevalence of HTN of 40.0% with a female predominance. This is close to the study by KANE (2018) who found a prevalence of HTN of 46.4% in his study on the prevalence of cardiovascular risk factors in a semi-rural area of Senegal [24]. Another study conducted in the same research area found a prevalence of 37.4% [35]. Hypertension is associated with all forms of cardiovascular diseases, including PAD [2]. The association between HBP and PAD has been demonstrated in most studies and significantly highlighted in the five indexed studies (Framingham Study, Framingham Offspring, Cardiovascular Health, Rotterdam and Multi-ethnic Study of Atherosclerosis) [29,36-38]. However, the degree of the association between HBP and PAD may seem sometimes modest (OR=1.32 in the Rotterdam study). Therefore, the risk attributable to HBP remains high (17.0% in the Rotterdam Study and even 41% in the Health Professionals Follow-up Study), due to the high prevalence of this risk factor in the population. In addition, in the Framingham study, 30% of the risk of Conversion Index (CI) in the population was attributable to blood pressure levels above 160/100 mm Hg. A study conducted on 3495 Chinese hypertensive patients showed a prevalence of 9% of PAD [39]. It is always the Framingham study that provides the most interesting information. Thus, the risk of PAD is multiplied by 2.5 in a hypertensive man and 3.9 in a woman [36]. In 2009, Benchimol et al. evaluated the detection of PAD by an automatic blood pressure monitor and found a population with 25% HBP as a risk factor, while at the University of Heidelberg in Germany, a study conducted in 2009 showed that 54% of the studied population was known to be hypertensive [40].

PAD and Sedentarity

The prevalence of sedentary lifestyle in our population was 26.7%, and it was more common in women than in men. Another recent study conducted in the same area reported a prevalence of 36.3% of the population [35]. It was more pronounced in women with 45.4% [95% CI: 38.5-52.4] versus 26.2% [95% CI: 20.2-33.2] in men. These results are similar to those of our survey. In our study, PAD was not associated with sedentary lifestyle, however 16.7% of PAD subjects were sedentary. In the Ngelle study, the prevalence of sedentary lifestyle was 91.07% among subjects with PAD [25]. The same was true for the Pessinaba et al. study, which showed a strong association between sedentary lifestyle and PAD [9,41].

Limitations and Perspectives

Our work had some limitations; indeed, the questionnaire did not consider some risk factors such as smoking, blood glucose or lipid profile. Indeed, smoking is considered as one of the main risk factors for PAD and is a risk factor found in almost all studies. Thus, in perspective, it would be necessary to conduct a study that will consider all the risk factors to study on a larger population.

Conclusion

Although it is an integral part of atheromatous diseases, PAD is still underdiagnosed in the Senegalese population. Moreover, our study confirms the high prevalence of some traditional cardiovascular risk factors and opens the door to the exploration of other factors already mentioned in previous studies but insufficiently studied and probably to more specific factors to this geographical area. Thus, the screening of PAD should be systematic in consultation for people with Cardiovascular Risk Factors (CVRF). Prospective studies are needed to determine the incidence, risk factors and predictive role of PAD in the African population. Prevention and management strategies for its risk factors such as hypertension and sedentary lifestyle should be implemented to reduce its incidence risk in this population.

Conflict of Interest

The authors declare that there is no conflict of interest.

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