A Pilot Study on the Prevalence of Peripheral Arterial Disease in Kigali, Rwanda

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Introduction

The global burden of peripheral arterial disease (PAD) is estimated to be over 230 million people but few studies have measured the prevalence of PAD in low- and middle-income countries such as Rwanda. Traditionally, research efforts in many African countries were geared towards communicable disease, but recently the tide has shifted to make efforts to reduce noncommunicable disease. The objective of this pilot study was to estimate the prevalence of PAD and associated risk factors in Kigali, Rwanda.

Methods

This is a multicenter, mixed-methods, cross-sectional study conducted at three health centers across Kigali, Rwanda. Patients older than 40 years old presenting for non-emergent reasons at the clinics were eligible for participation in the study. An ankle-brachial index (ABI) was measured using the Unetixs Revo 1100/8 MHz probe for PAD screening. An ABI </=0.9 was the value diagnostic for PAD, and >1.3 was used for an inconclusive ABI. A self-reported survey was collected to determine demographics and medical history.

ABI Measurement	Interpretation
>1.3	Abnormal Calcification (Inconclusive)
0.9 – 1.3	Normal
≤0.9	Peripheral Artery Disease

Results

A total of 861 participants were included in this study with an overall PAD positivity rate of 3.14% (27 patients). Additionally, 166 patients (19.3%) had inconclusive ABIs. Patients who screened positive for PAD were significantly more likely to be older (63 vs 56, p=0.009), of lower wealth indexes (p=0.016), and were more likely to be current or former smokers (13 (48.1%) vs 217 (32.5%), p=0.041). Patients with inconclusive ABIs were significantly more likely to be male (70 (42%) vs 140 (21%), p=<0.001), more likely to have chronic kidney disease (4 (2.4%) vs 2 (0.3%), p=0.016), and more likely to be positive for human immunodeficiency virus (HIV) (44 (27%) vs 127 (19%), p=0.041).

Characteristic	Normal ABI (N= 668)	PAD (N= 27)	Normal vs PAD p-value	Inconclusive ABI (N= 166)	Normal vs Inconclusive p-value
Age	56 [48 - 63]	63 [54 - 70]	0.009	56 [49 - 63]	0.545
Sex			0.182		<0.001
Female	527 (79%)	18 (67%)		96 (58%)	
Male	140 (21%)	9 (33%)		70 (42%)	
Unknown	1 (0.15%)	0 (0%)		0 (0%)	
Location			0.059		<0.001
Masaka	224 (34%)	15 (56%)		27 (16%)	
Remera	194 (29%)	4 (15%)		77 (46%)	
Nyiranuma	250 (37%)	8 (30%)		62 (37%)	
Insurance Status			1.000		0.282
National	649 (97%)	27 (100%)		164 (99%)	
Other	19 (2.8%)	0 (0%)		2 (1.2%)	
Ubedehe Wealth Index			0.016		0.311
A	21 (3.1%)	2 (7.4%)		5 (3.0%)	
B	108 (16%)	0 (0%)		32 (19%)	
C	411 (62%)	21 (78%)		106 (64%)	
D	93 (14%)	2 (7.4%)		14 (8.4%)	
E	32 (4.8%)	1 (3.7%)		7 (4.2%)	
Unknown	3 (0.045%)	1 (3.7%)		2 (1.2%)	
T2DM	163 (24%)	7 (26%)	0.822	29 (17%)	0.064
HTN	296 (44%)	16 (59%)	0.166	53 (32%)	0.004
HLD	10 (1.5%)	0 (0%)	1.000	0 (0%)	0.225
CKD	2 (0.30%)	1 (3.7%)	0.112	4 (2.4%)	0.016
Prior MI	6 (0.90%)	1 (3.7%)	0.243	0 (0%)	0.605
Stroke	6 (0.90%)	0 (0%)	1.000	0 (0%)	0.605
HIV Status	127 (19%)	3 (11%)	0.450	44 (27%)	0.041
Smoking Status			0.041		0.241
Current	32 (4.8%)	4 (15%)		3 (1.8%)	
Former	185 (28%)	9 (33%)		46 (28%)	
Never	451 (68%)	14 (52%)		117 (70%)	
Obesity	99 (15%)	6 (22%)	0.277	29 (17%)	0.401

Conclusions

- The prevalence of PAD in Kigali, Rwanda was similar to ranges quoted in the literature at 3.14%
- There were a significant number of inconclusive ABIs in our study, potentially due in part to higher rates of HIV in this population
- Traditional risk factors such as diabetes and hypertension may hold smaller roles in the etiology of disease in Rwanda.

Future Directions

Further studies are needed to evaluate vascular disease in this population and similar countries to help provide supporting evidence for future interventions. Work aimed at primary prevention can relieve the burden of PAD in this population.

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