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Studying the Relationship Between Retinopathy and Lower Peripheral Artery Disease, A Study Between the Years (2021-2022) In Iraq

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ABSTRACT

Background: More than 200 million people globally and 8 to 10 million adults in the United States suffer with lower-extremity peripheral arterial disease (PAD). Major clinical outcomes such as death, heart attack, stroke, cardiovascular disease, and lower-extremity amputation are all linked to PAD. Objective: This paper aims to study the relationship between retinopathy and lower peripheral artery disease, a study between the years (2021-2022) in Iraq. Patients and methods: This paper was presented as a sectional

study where it interested to study the relationship between retinopathy and lower peripheral artery disease, which occurred with lower peripheral artery disease patients in the range (40-70) years with (41) patients' cases. This paper was characterized into two groups, which are PAD patients and PAD controls. This paper has examined all data of demographic characteristics into lower peripheral artery disease outcomes related to operative patients by the SPSS program, which conduct for all data was extracted in a study between 14th August 2021 to 25th May 2022 in different hospitals in Iraq. Discussion: Our findings linking retinal to elevated PAD risk are in line with other research that found correlations between retinopathy measurements and other atherosclerotic illnesses, including stroke and coronary heart disease, in both groups without diabetes and without. But, in our analysis, the relationships between retinopathy measurements and PAD controls were extremely strong. In fact, retinopathy had higher links with PAD controls in our research sample than it did overall coronary heart disease as well as stroke. Importantly, both preoperatively and postoperatively, there were more hemorrhages than controls. Conclusion: In conclusion, our study discovered that markers of retinopathy, such as retinal hemorrhage, were significantly higher in the PAD patient group and were linked with diabetes. These findings would have an impact on their preventative and therapeutic methods and support the idea that microvascular illness contributes to the development of PAD.

Introduction

More than 200 million people globally and 8 to 10 million adults in the United States suffer with lower-extremity peripheral arterial disease (PAD) [1]. Major clinical outcomes such as death, heart attack, stroke, cardiovascular disease, and lower-extremity amputation are all linked to PAD. [2]

Because many PAD patients have atherosclerosis in big arteries, PAD is frequently thought of as an extensive artery disease [3,4]. On the contrary, microvascular illness is suggested to have a significant role in the occurrence of critical limb injury (CLI), an exceptionally severe type of PAD, by inhibiting collateral development and wound healing [6]. Indeed, retinopathy has been established as a predictor with PAD severity and development in a modest number of studies (n100) of diabetes individuals. [7]

To our knowledge, a sizable community-based cohort has never been systematically analysed to determine the relationship between objectively measured retinal measurements and the onset of PAD [8]. Therefore, our goal was to measure the correlations between the incidence of PAD with CLI in the Atherosclerosis Risk Factor in Communities (ARIC) Study and retinal results [9], which provide in vivo visible information on the microvasculature. We predicted in

advance that retinal results would be very closely linked to incident CLI. [10,11]

The main cause of blindness in working-age individuals nowadays is diabetes-related retinopathy (DR), a microvascular condition that may be easily detected by digital retinal pictures at an early stage [12,13]. Proliferative diabetic retinopathy (PDR) generally follows non-proliferative diabetic retinopathy (NPDR). However, not every patient with diabetes will inevitably get PDR. [14]

From 0 to 15 years of having diabetes, the incidence of PDR rises. The likelihood of acquiring PDR is still unchanged after 15 years [15]. Numerous studies have demonstrated the link between DR and cardiovascular disease (CVD) [16]. Furthermore, PDR had a stronger correlation with CVD than NPDR did. It has been suggested that PDR and lower extremity PAD may be related since PAD is one of the asymptomatic cardiovascular illnesses [17]. This paper aims to study the relationship between retinopathy and lower peripheral artery disease, a study between the years (2021-2022) in Iraq.

Patients and methods

This paper was presented as a sectional study where it interested to study the relationship between retinopathy and lower peripheral artery disease, which occurred with lower peripheral artery disease patients in the range (of 40-70) years with (41) patients' cases. This paper was characterized into two groups, which are PAD patients and PAD controls. This paper has examined all data of demographic characteristics into lower peripheral artery disease outcomes related to operative patients by the SPSS program, which conduct for all data was extracted in a study between 14th August 2021 to 25th May 2022 in different hospitals in Iraq.

This paper was examining all baseline of characterises data for distributions of characteristics demographic into lower peripheral artery disease patients based on age, sex, smoking with smokers and non-smokers, alcohol, and BMI, into four sections which are (26.53), (29.40), (32.70), and (34.66), and Diabetes in between patients and controls group where it was shown in Table 1, Table 2, Table 3, Table 4, Table 5, and Table 6.

To follow that, this paper was extended to study Changes of blood pressure into lower peripheral artery disease for the patients' group, where it was conducted with two parameters: Systolic blood pressure, mmHg (SD), and Diastolic blood pressure, mmHg (SD) to compare between PAD patients and PAD controls where all demographic information were presented in Figure 1 and Figure 2.

Furthermore, this study was Determined of lower peripheral artery disease causes, which presented into Changes in muscles or ligaments, Injury to the arms or legs, and vasculitis as well. As it also determined lower peripheral artery disease symptoms that divided into Coolness in the lower leg, erectile dysfunction, Leg numbness or weakness, No or weak pulse in the legs or feet, and Painful cramps in the muscles of the hips where outcomes were cleared into Table 7 and Table 8.

In progressing of outcomes, this paper was studied to occur distributions of lipoprotein cholesterol measurements for the lower peripheral artery disease control group as, well as the determination of Distributions of lipoprotein cholesterol measurements for the lower peripheral artery disease PAD patients' group was estimated by Low-density lipoprotein cholesterol, mg/dl and High-density lipoprotein cholesterol, mg/dl which the results were found in Figure 3 and Figure 4.

To further of results, this paper was extended to assess of lower peripheral artery disease complications into the patients' group and controls which parameters were presented into Bleeding, Damage to peripheral nerves, Heart attack, none, and Prevalent stroke that results have been seen in Table 9 and Table 10.

In the side of Shaping haemorrhages, this paper was conducting of Shaping haemorrhages preoperative comparisons between PAD patients and PAD control within preoperative and post-operative where depend on Flame-shaped haemorrhages, Blot-shaped haemorrhages, and Any haemorrhages which results can be found in Figure 5 and Figure 6.

The outcomes were extended to assess the difference of the type of Central retinal impact on lower peripheral artery disease patients were determined into Central retinal artery equivalent (CRAE) and Central retinal venous equivalent (CRVE) that the outcomes can be resulted in Figure 7.

In the final of methodology, this paper was assessed into risk factors related to lower peripheral artery disease on the Central retinal, where determined basics parameters into Age, Haemorrhages, Vasculitis, Diabetes, Prevalent stroke, and Blood pressure. The results were estimated in Table 11.

Results

Table 1: Distributions of characteristics demographic into lower peripheral artery disease patients based on ages.

Ages

N	Val	41
	Mi	0
Me		55.1707
SEOF		1.26390
Med		56.0000
Mo		51.00[a]
SD		8.09291
Var		65.495
Sk		-.054
SEK		.369
Ra		30.00
Min		40.00
Max		70.00
S		2262.00

Table 2: Distributions of characteristics demographic into lower peripheral artery disease patients based on sex.

		Freq.	P (%)	VP (%)	CP (%)
Val	Female	12	29.3	29.3	29.3
	Male	29	70.7	70.7	100.0
	T	41	100.0	100.0	

Table 3: Distributions of characteristics demographic into lower peripheral artery disease patients based on smoking.

		Freq.	P (%)	VP (%)	CP (%)
V	Non-smoker	12	29.3	29.3	29.3
	Smoker	29	70.7	70.7	100.0
	T	41	100.0	100.0	

Table 4: Distributions of characteristics demographic into lower peripheral artery disease patients based on alcohol.

alcohol

		Freq.	P (%)	VP (%)	CP (%)
V	No	29	70.7	70.7	70.7
	Yes	12	29.3	29.3	100.0
	T	41	100.0	100.0	

Table 5: Distributions of characteristics demographic into lower peripheral artery disease patients based on BMI.

		Freq.	P (%)	VP (%)	CP (%)
Val	26.53	8	19.5	19.5	19.5
	29.40	12	29.3	29.3	48.8

	32.70	10	24.4	24.4	73.2
	34.66	11	26.8	26.8	100.0
	T	41	100.0	100.0	

Table 6: Distributions of characteristics demographic into lower peripheral artery disease patients based on Diabetes.

Diabetes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	14	34.1	34.1	34.1
	Yes	27	65.9	65.9	100.0
	Total	41	100.0	100.0	

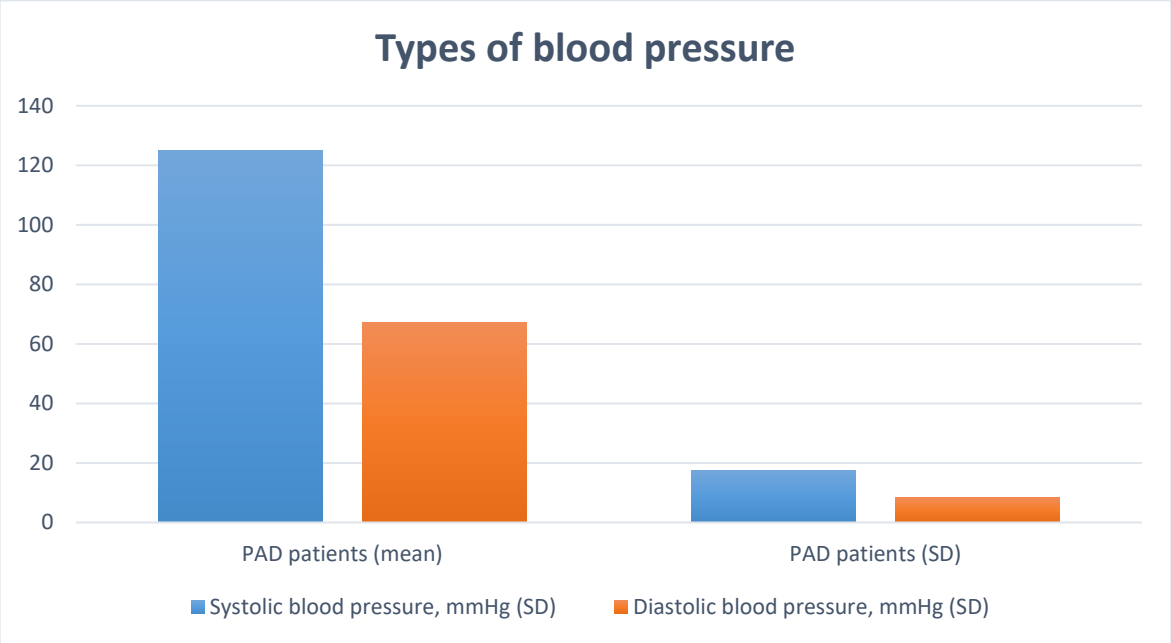

Figure 1: Changes of blood pressure into lower peripheral artery disease for patients' group.

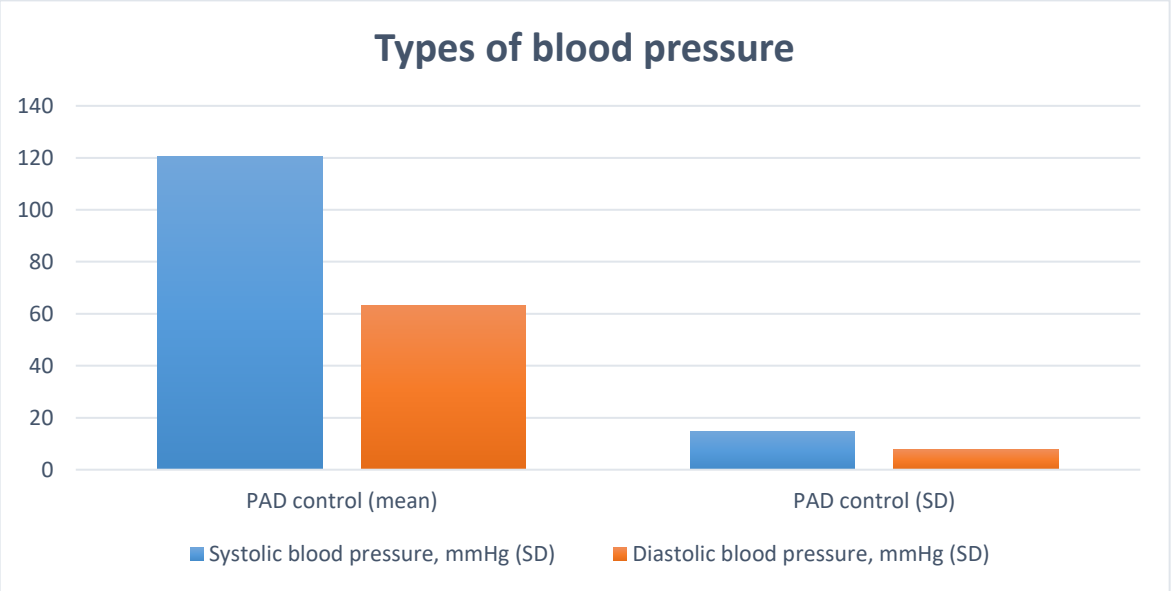

Figure 2: Changes of blood pressure into lower peripheral artery disease for the control group.

Table 7: Determinations of lower peripheral artery disease causes.

		Freq.	P (%)	VP (%)	CP (%)
Val	Changes in muscles or ligaments	11	26.8	26.8	26.8
	Injury to the arms or legs	9	22.0	22.0	48.8
	vasculitis	21	51.2	51.2	100.0
	T	41	100.0	100.0	

Table 8: Determinations of lower peripheral artery disease symptoms.

		Freq.	P (%)	VP (%)	CP (%)
Val	Coolness in the lower leg	10	24.4	24.4	24.4
	erectile dysfunction	6	14.6	14.6	39.0
	Leg numbness or weakness	5	12.2	12.2	51.2
	No or weak pulse in the legs or feet	12	29.3	29.3	80.5
	Painful cramps in the muscles of the hips	8	19.5	19.5	100.0
	T	41	100.0	100.0	

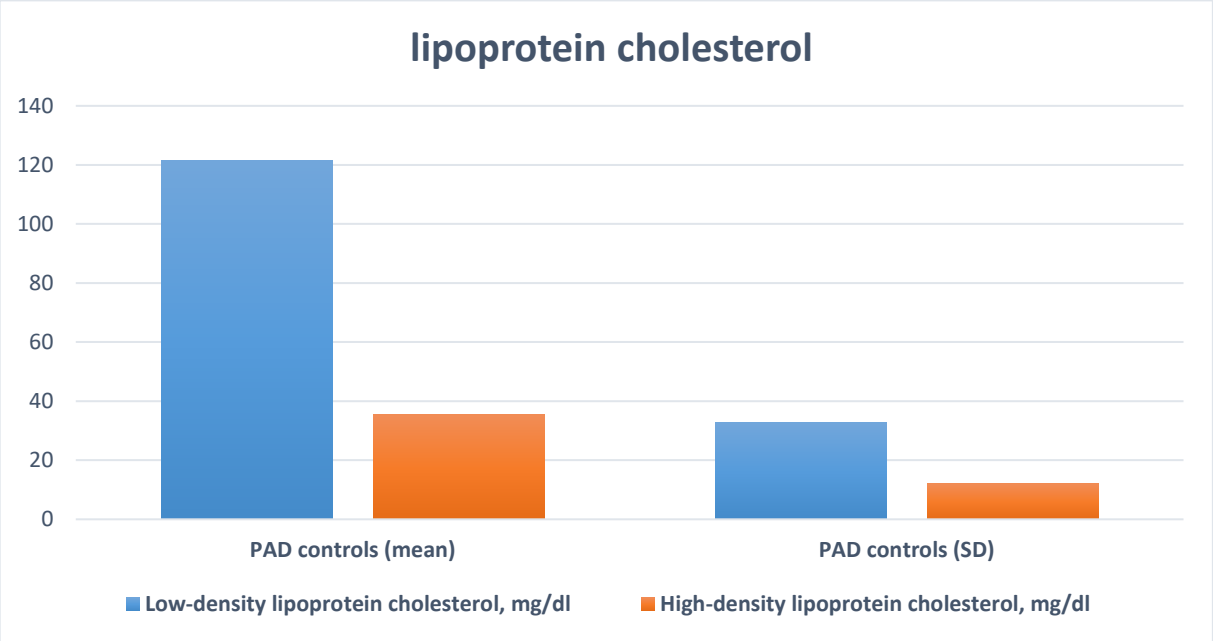

Figure 3: Distributions of lipoprotein cholesterol measurements for lower peripheral artery disease controls group.

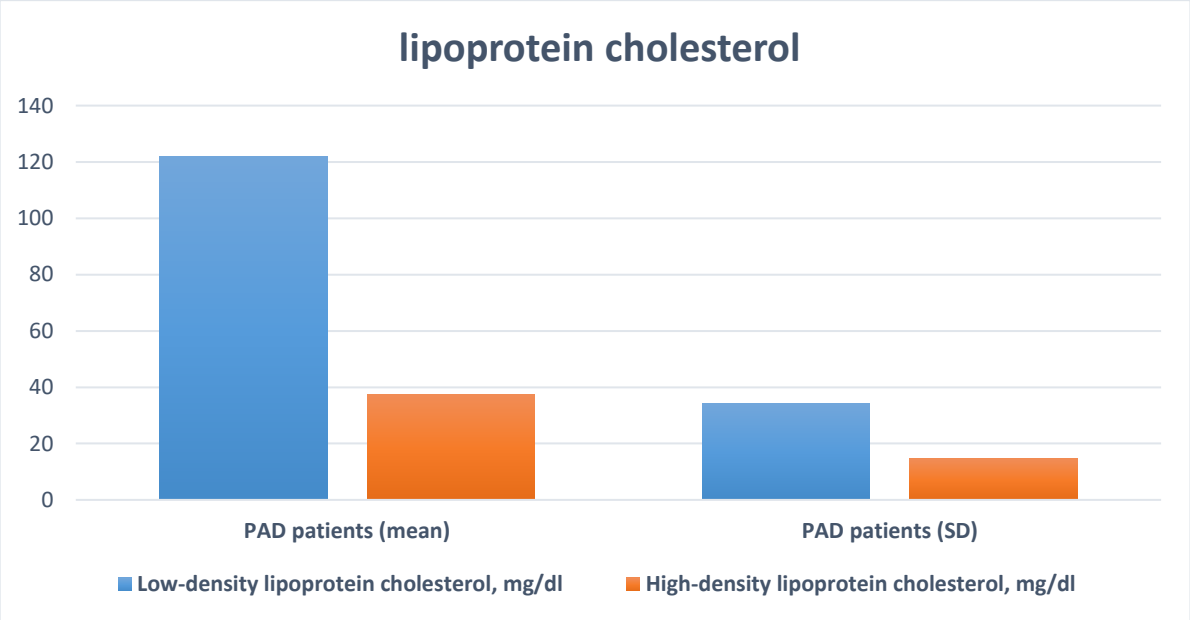

Figure 4: Distributions of lipoprotein cholesterol measurements for lower peripheral artery disease PAD patients' group.

Table 9: Assessments of lower peripheral artery disease complications into the patients' group.

		Freq.	P (%)	VP (%)	CP (%)
Val	Bleeding	4	9.8	9.8	9.8

	Damage to peripheral nerves	3	7.3	7.3	17.1
	Heart attack	4	9.8	9.8	26.8
	none	24	58.5	58.5	85.4
	Prevalent stroke	6	14.6	14.6	100.0
	T	41	100.0	100.0	

Table 10: Assessments of lower peripheral artery disease complications into the control group

		Freq.	P (%)	VP (%)	CP (%)
Val	Bleeding	3	7.3	7.3	7.3
	Damage to peripheral nerves	2	4.9	4.9	12.2
	Heart attack	2	4.9	4.9	17.1
	Infection	1	2.4	2.4	19.5
	none	30	73.2	73.2	92.7
	Prevalent stroke	3	7.3	7.3	100.0
	T	41	100.0	100.0	

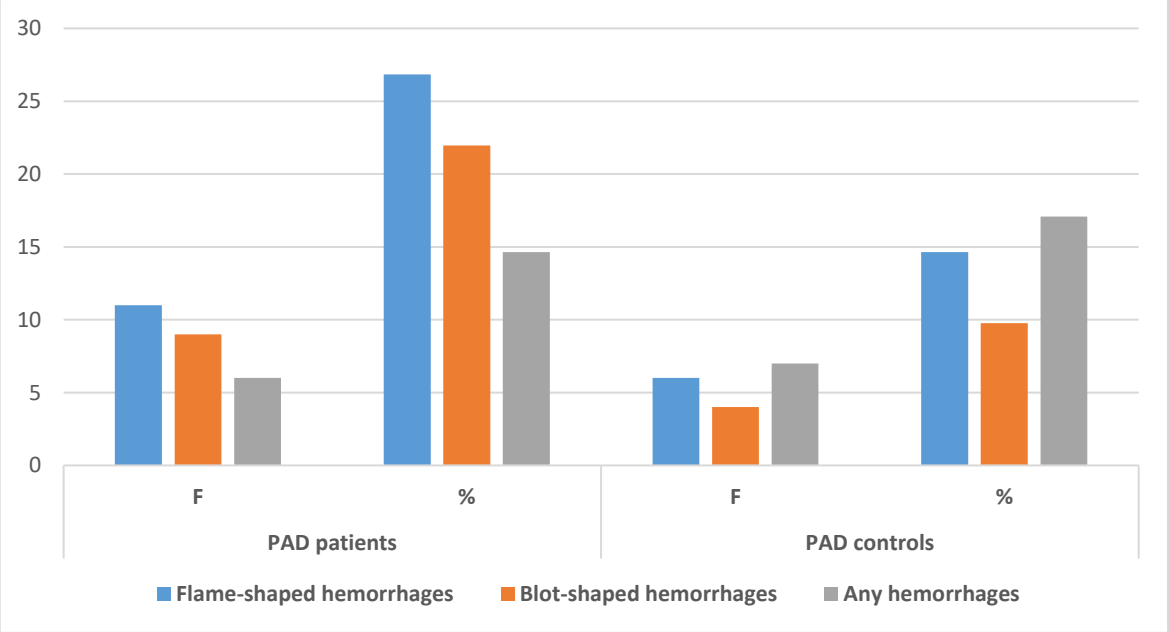

Figure 5: Conducting of Shaping hemorrhages preoperative comparisons between PAD patients and PAD control within preoperative.

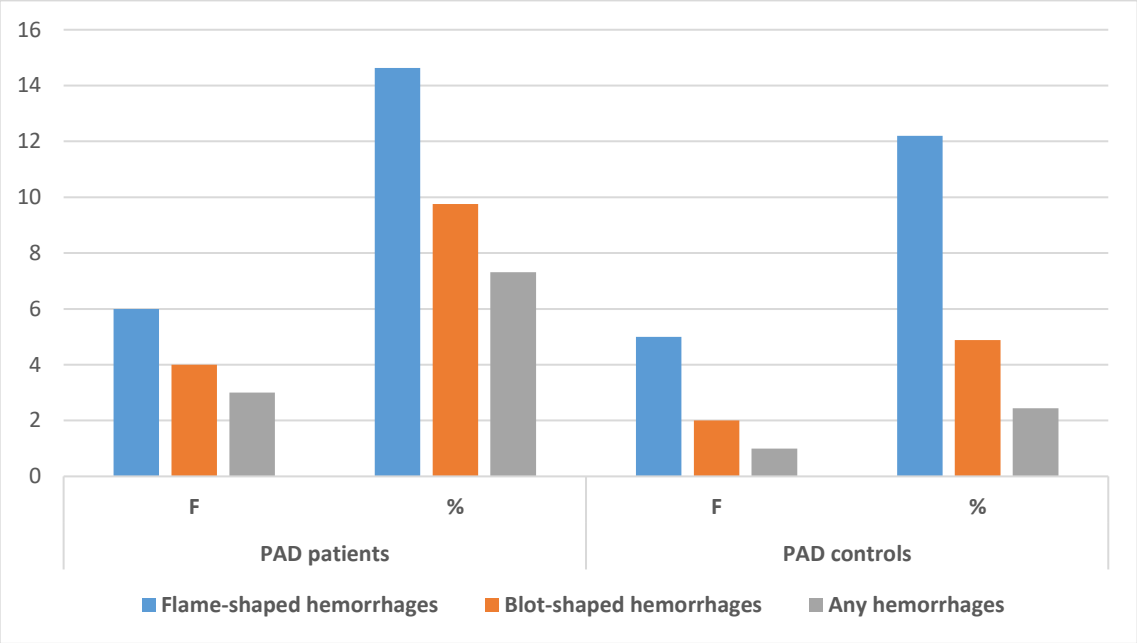

Figure 6: Conducting of Shaping hemorrhages preoperative comparisons between PAD patients and PAD control within post-operative.

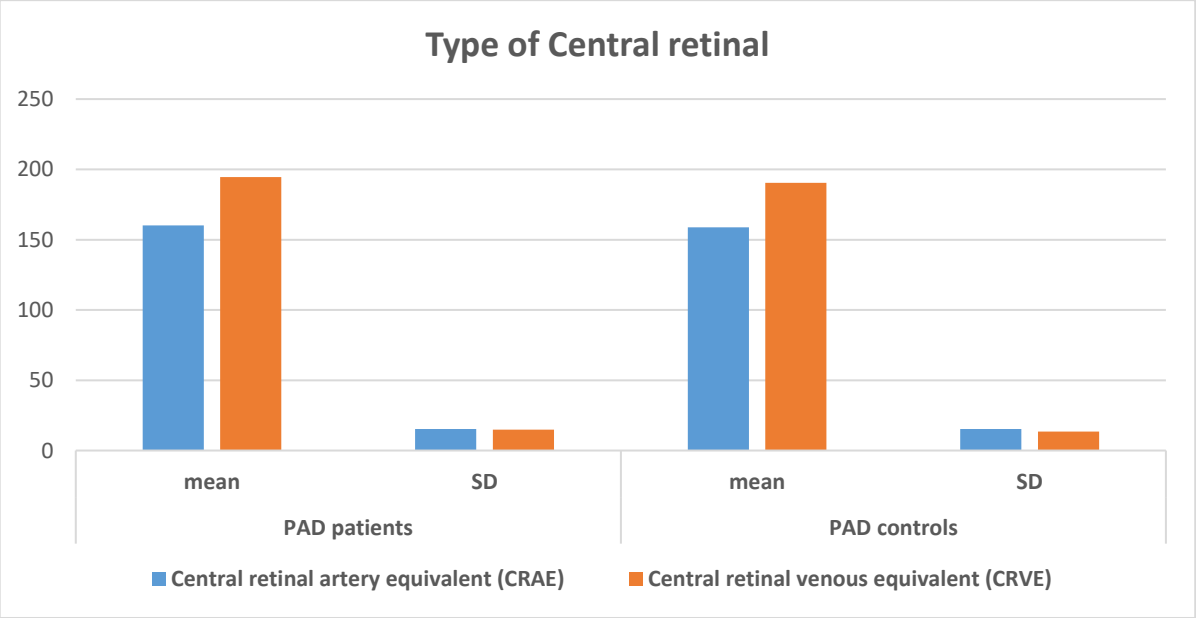

Figure 7: Difference of type of Central retinal impact on lower peripheral artery disease patients.

Table 11: Assessments of risk factors related to lower peripheral artery disease on Central retinal.

Parameters	**PAD patients**	**PAD controls**	**P-value**
Age	3.5 (2.6-6.2)	4.4 (2.3-5.8)	0.0226

Hemorrhages	2.8 (2.0-3.4)	5.8 (3.6-7.4)	0.0355
Vasculitis	3.6 (2.6-5.43)	5.2 (3.7-7.73)	0.0438
Diabetes	2.8 (2.1-5.28)	3.66 (2.76-6.57)	0.0377
Prevalent stroke	0.7 (0.02-1.5)	1.3 (0.2-4.42)	0.0237
Blood pressure	3.73 (2.57-5.12)	6.43 (3.7-8.5)	0.0452

Discussion

Measures of retinopathy, which include blot-shaped bleeding, exudates, and microaneurysms, were independently and substantially linked to an elevated risk of PAD within this bi-racial, community-based cohort analysis. Retinal vascular calibers, however, did not significantly correlate with patients' PAD. Despite appearing to be particularly significant among those with diabetes, the correlations between retinopathy and PAD risk were largely stable throughout various demographic and clinical categories. After further adjustment for the length of time of diabetes, the relationships among those with diabetes remained constant. [18]

Our findings linking retinal to elevated PAD risk are in line with other research that found correlations between retinopathy measurements and other atherosclerotic illnesses, including stroke and coronary heart disease, in both groups without diabetes and without. But, in our analysis, the relationships between retinopathy measurements and PAD controls were extremely strong. In fact, retinopathy had higher links with PAD controls in our research sample than it did overall coronary heart disease as well as stroke. Importantly, both preoperatively and postoperatively, there were more hemorrhages than controls.

Since diabetes is an important cause of retinal and many research participants had diabetes, it may not be unexpected that we found higher correlations among retinopathy measurements as well as patient PAD among those suffering from diabetes than in those without. However, our findings show that retinal abnormalities are particularly predictive in diabetics. [19]

In fact, previous studies on people with diabetes demonstrated that retinopathy was a distinct risk factor with all-cause mortality as well as fatal or nonfatal cardiovascular events; our study extends this finding to PAD. Further evidence for the predictive significance of retinal measurements in diabetes may be seen in our discovery that blot-shaped haemorrhages, a phenotype of diabetic retinopathy, are more frequently associated with PAD than flame-shaped haemorrhages, which have hypertension as a significant cause [20]. Although the presence of retinopathy may simply reflect the length and severity of diabetes, and hyperglycaemia was linked to an elevated risk of controls PAD, we discovered that retinopathy related to PAD.

Conclusion

In conclusion, our study discovered that markers of retinopathy, such as retinal hemorrhage, were significantly higher in the PAD patient group and were linked with diabetes. These findings would have an impact on their preventative and therapeutic methods and support the idea that microvascular illness contributes to the development of PAD.

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