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PREVALENCE OF PERIPHERAL ARTERY DISEASE IN PATIENTS WITH CORONARY HEART DISEASE

Hadi Hilal Hamza[1], Ahmed Basher.M[2] and Ali S. Dawood*[3]

[1]Iraqi Center of Cardiac Disease, Baghdad Medical City, Baghdad, Iraq.
[2]Department of Internal Medicine, College of Medicine, Wasit University, Wasit, Iraq.
[3]Department of Pathology and Forensic Medicine, College of Medicine, Wasit University, Wasit, Iraq.

***Corresponding Author: Ali S. Dawood**
Department of Pathology and Forensic Medicine, College of Medicine, Wasit University, Wasit, Iraq.

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ABSTRACT

Objective: To study the relationship between coronary heart disease (CHD) and peripheral artery disease (PAD). **Methods:** A total of 166 patients (122 male and 44 female) with an ages between (33-81) years old and age mean ± SD (58.29±8.667), the ages divided to three groups in order to correlate with others parameters, the first group were (33-39) years old, the second group were (40-59) years old and the third group were (60 years old and above), all patients were diagnosed with coronary heart diseases a proved by coronary angiography and Ankle-Brachial Index Measurement was done to determine the peripheral artery disease. **Results:** The current results showed significance between ages groups and Ankle-Brachial Index values (P= 0.008). Otherwise, our results showed that no significance between ages group and CHD (severity of lesions in coronary artery branches) (P= 0.456). On the other hand, the correlation between the severity of lesions in coronary artery branches and Ankle-Brachial Index values showed statistical significance (P= <0.001). **Conclusion:** Our study proved that, the middle and older ages with CHD may be more risky to PAD development than young ages, also the severity of lesions in coronary artery branches (1,2 or 3 vessels) have the same chance to PAD development with Ankle-Brachial Index values ranged between mild and moderate.

KEYWORD: Coronary heart disease, Peripheral artery disease, Coronary angiography, Ankle-Brachial Index

INTRODUCTION

Peripheral artery disease (PAD), known as Narrowing or blockage of the arteries supplying blood to the lower limbs, the atherothrombosis consider principal causative agent for (PAD) occurrences.[1] The stenosis or occlusion of the arteries in (PAD), particularly found in the lower extremities.[2] Also the (PAD) associated with reduced functional capacity.[3,4] Approximately 70% of PAD cases can be explained by established risk factors such as older age.[5] The prevalence of PAD is estimated to be 10%–25% in people aged ≥55 years and increases to approximately 40% in community populations aged >80 years.[6,7] Otherwise, the association between sex and PAD is less clear.[8] Peripheral artery disease (PAD) is common in patients with coronary artery disease (CAD), with a prevalence of 22– 42%,[9-11] and increased risk for cardiovascular morbidity and mortality.[12-14] The aim of our study was to determine the association between the coronary artery diseases and peripheral artery diseases in a sample of Iraqi population.

METHODS

Patients

166 cases (122 male and 44 female) were diagnosed with ischemic heart diseases according to the coronary angiography, with an ages between (33-81) years old, age mean ± SD (58.29±8.667), the ages divided to three groups in order to correlate with others parameters, the first group were (33-39) years old, the second group were (40-59) years old and the third group were (60 years old and above). The patients were enrolled in this study and recruited at Iraqi center for heart diseases, medical city, Baghdad, Iraq. The Ethics Committees of participating and Iraqi center for heart diseases approved the study, and informed consent was obtained from all participants.

Coronary Angiography

All the patients underwent angiography study, the patients admitted to the ward for a few hours beforehand to check out general health of patients and to prepare them for the angiogram, the warfarin that taking usually by some patients is already stopped previously, the procedure traditionally done by injecting a radio-opaque

contrast agent into the coronary arteries and imaging using X-ray based techniques. After procedure the patients divided according to the severity of coronary artery branches lesions as fellow (1 vessel, 2 vessels and 3 vessels).

Ankle-Brachial Index Measurement

The ankle-brachial index (ABI) is an efficient tool for objectively documenting the presence of lower-extremity peripheral arterial disease, measurement of the ABI was easily performed in a clinician's office using a blood pressure (BP) cuff and handheld Doppler device with a vascular probe. Systolic BP was determined in both arms and both ankles. After the current approach the patients divided according to the findings of ankle-brachial index test as fellow (1.0 - 1.2 is normal, 0.90-0.71 is mild, 0.70-0.41 is moderate and 0.40 and below is severe).

Statistical Analysis

Statistical analysis done by using statistical package for social studies (SPSS 22). Associations between different variables were measured by ANOVA test, Chi-Square test. P value of <0.05 considered as level of statistically significance, 95% confidence interval (95% CIs) were calculated for different studied parameters. The confidence interval (CI) at 95% was used to describe the amount of uncertainty associated with the samples.

RESULTS

In the currents results, the frequency of ages groups were (33-39) years old 5 patients, (40-59) years old 76 patients and (60 years old and above) 85 patients respectively as showed in table 1. Regarding to the sex group, the frequency were (122 male and 44 female) as showed in table 2. The frequency of Ankle-Brachial Index values among the patients were as fellow, (120 were normal, 21 were mild, 23 were moderate and 2 is severe) as showed in table 3. Also the distributions of the severity of coronary artery branches lesions among the patients were as fellow (83 patients were 1 vessel, 52 patients were 2 vessels and 31 patients were 3 vessels) as showed in table 4.

Table 1: Show the frequency of ages groups.

Ages groups	Frequency	Percent
(33-39) years old	5	3.0
(40-59) years old	76	45.8
(60 years old and above)	85	51.2
Total	166	100.0

Table 2: show the frequency of sex group.

Sex	Frequency	Percent
Male	122	73.5
Female	44	26.5
Total	166	100.0

Table 3: show the frequency of Ankle-Brachial Index values among the patients.

Ankle-Brachial Index values	Frequency	Percent
Normal	120	72.3
Mild	21	12.7
Moderate	23	13.9
Severe	2	1.2
Total	166	100.0

Table 4: show the frequency of the severity of coronary artery branches lesions.

Number of vessels	Frequency	Percent
1 vessel	83	50.0
2 vessels	52	31.3
3 vessels	31	18.7
Total	166	100.0

The correlations between the ages groups and Ankle-Brachial Index values showed highly significance association and the distribution of parameters were as fellow, (33-39) years old (4 normal, 0 mild, 0 moderate and 1 severe), (40-59) years old (53 normal, 10 mild, 12 moderate and 1severe) and (60 years old and above) (63 normal, 11 mild, 11 moderate and 0severe). The P value was (0.008) as shown in the table 5.

Table 5: show the correlation of the ages groups and Ankle-Brachial Index values.

Ages groups		Ankle-Brachial Index values				Total	Monte Carlo Sig. (2-sided) 95% Confidence Interval		P
		Normal	Mild	Moderate	Severe		Lower Bound	Upper Bound	
(33-39) years old	Count	4	0	0	1	5	(0.004-0.055)		0.008
	% of Total	2.4%	.0%	.0%	.6%	3.0%			
(40-59) years old	Count	53	10	12	1	76			
	% of Total	31.9%	6.0%	7.2%	.6%	45.8%			
(60 years old and above)	Count	63	11	11	0	85			
	% of Total	38.0%	6.6%	6.6%	.0%	51.2%			
Total	Count	120	21	23	2	166			
	% of Total	72.3%	12.7%	13.9%	1.2%	100.0%			

Significance at <0.05

On the other hand, correlations between the ages groups and severity of lesions in coronary artery branches showed that, there are no significance associations, and the distribution of parameters were as fellow, (33-39) years old (1 vessel 3, 2 vessels 2, and 3 vessels 0), (40-59) years old (1 vessel 41, 2 vessels 19, and 3 vessels 16) and (60 years old and above) (1 vessel 39, 2 vessels 31, and 3 vessels 15). The P value was (0.456) as shown in the table 6.

Table 6: show the correlation of the ages groups and severity of lesions in coronary artery branches.

Ages groups		severity of lesions in coronary artery branches			Total	Monte Carlo Sig. (2-sided) 95% Confidence Interval		P
		1 vessel	2 vessels	3 vessels		Lower Bound	Upper Bound	
(33-39) years old	Count	3	2	0	5	(0.384-0.534)		0.456
	% of Total	1.8%	1.2%	.0%	3.0%			
(40-59) years old	Count	41	19	16	76			
	% of Total	24.7%	11.4%	9.6%	45.8%			
(60 years old and above)	Count	39	31	15	85			
	% of Total	23.5%	18.7%	9.0%	51.2%			
Total	Count	83	52	31	166			
	% of Total	50.0%	31.3%	18.7%	100.0%			

Significance at <0.05

The ANOVA test showed the significance association between the severity of coronary artery branches lesions and Ankle-Brachial Index values as fellow, 1 vessel (71 normal, 10 mild, 2 moderate and 0 severe), 2 vessel (33 normal, 8 mild, 10 moderate and 1 severe), and 3 vessel (16 normal, 3 mild, 11 moderate and 1 severe). The P value was (<0.001) as shown in the table 7.

Table 7: show the correlation of the severity of coronary artery branches lesions and Ankle-Brachial Index values.

severity of lesions in coronary artery branches	Ankle-Brachial Index values				Total	95% Confidence Interval		F	P
	Normal	Mild	Moderate	Severe		Lower Bound	Upper Bound		
1 vessel	71 42.8%	10 6.0%	2 1.2%	0 0.0%	83 50.0%	(1.57-1.80)		10.005	<0.001
2 vessels	33 19.9%	8 4.8%	10 6.0%	1 0.6%	52 31.3%				
3 vessels	16 9.6%	3 1.8%	11 6.6%	1 0.6%	31 18.7%				
Total	120 72.3%	21 12.7%	23 13.9%	2 1.2%	166 100.0%				

Significance at <0.05

DISCUSSION

Different studies have been discussed the association between PAD and CHD events, with a prevalence of 22–42%.[9,10,11] In our study, firstly we correlated the ages groups and Ankle-Brachial Index values; otherwise we correlated the ages groups and severity of lesions in coronary artery branches. According to the role of age in development of PAD, Our findings showed highly statistical significance among correlation, 95% Confidence Interval (0.004-0.055), P value = 0.008, and most frequent values between groups (40-59) years old and (60 years old and above), the most frequent values ranged between normal, mild and moderate. Regarding to our finding we suggest the middle and old ages patients with CHD may be more than young ages to exposure to PAD development with 26.4 %. In the recent studies, revealed that the prevalence of PAD is estimated to be 10%–25% in people aged ≥55 years and increased to 40% in people aged >80 years.[4,5] Recent research, done on a defined population comprising inpatients >45 years of age with one or more conventional risk factors for PAD using the ABI as the diagnostic parameter, 18% of the subjects had PAD.[15] The Edinburgh Artery Study studied the age stratified sample between 55 years and 74 years and found a prevalence of 9%.[16] The Rotterdam Study showed a prevalence of 7.6% in age group of 55–59 years, which increased to 59.6% in age >85 years.[17] Newman et al. have shown a prevalence of 26% in a population aged ≥ 60 years.[18] Otherwise, the correlation between ages groups and severity of lesions in coronary artery branches, according to our finding, there is no significance finding, 95% Confidence Interval (0.384-0.534), P value = 0.456. Regarding to our finding we suggest that, the ages patients with lesion in 2 and 3 vessels are ranged between (40-59) years old and (60 years old and above). Otherwise, in the current study and regarding our results, we found statistical significance 95% Confidence Interval (1.57-1.80), F= 10.005 and P value = <0.001 between severity of lesions in coronary artery branches and Ankle-Brachial Index values correlation, our suggestion that, the patients with CHD (lesions in 1, 2 and 3 vessels) presented with PAD ranged between mild and moderate 12.7% and 13.9% respectively. One of the more severe and mainly recognized clinical presentations of PAD is critical limb ischemia (CLI); which presents as rest pain, ischemic ulceration or gangrene of the foot. Patients with CLI have a high risk of fatal or non-fatal vascular events, such as myocardial infarction (MI).[19] Recent study shown that, the patients with CAD who develop PAD remain at significantly elevated risk for secondary CV events, including death, with inflammation appearing to be a strong risk factor for this excess risk. This suggests that patients with PAD are a highly vulnerable subgroup of patients with CAD who might benefit from more aggressive medical therapy or revascularization.[20] Also many previous studies proved that the presence of comorbid PAD is associated with an increased risk of secondary events among patients with CAD.[21,22] Sharmistha Sarangi et al. in recent study found that, there is a definite and strong correlation between PAD and CAD. Correct diagnosis and supervision of patients with PAD is important for preventing the local progression of the disease and effective secondary prevention of future coronary and cerebrovascular events.[15] Another study done by Doobay and Anand have shown that a low ABI between 0.8 and 0.9 has a high specificity of 92% to predict CAD and 87% for cardiovascular mortality.[23] Otherwise in recent research showed that 16% of patients had PAD and CAD, 13% had only PAD, and 24% had only CAD.[24]

CONCLUSION

In conclusion, we suggested there is a definite association between CHD and PAD. The middle and older ages with CHD may be more risky to PAD development than young ages, furthermore the severity of lesions in coronary artery branches (1, 2 or 3 vessels) have the same chance to PAD development with Ankle-Brachial Index values ranged between mild and moderate.

Declaration of conflicting interest

The authors report no conflicts of interest.

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