Peripheral Arterial Disease among Chronic Kidney Disease Patients Undergoing Hemodialysis in Remedios Trinidad Romualdez Hospital Hemodialysis Unit from July 2019 to July 2020

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Objectives: To determine the prevalence and clinical profile of peripheral arterial disease among chronic kidney disease patients undergoing hemodialysis using the ABI test at the Remedios Trinidad Romualdez Hospital.

Methods: We performed a prospective, cross - sectional analytical study involving eighty (80) adult CKD-HD patients with PAD from July 1, 2019 to July 31, 2020 at the Remedios Trinidad Romualdez Hospital, Tacloban City. Patients' clinical characteristics and presence of risk factors such as smoking history, hypertension, diabetes, dyslipidemia, and atherosclerotic cardiovascular disease were reviewed. Laboratory parameters obtained were Fasting Blood Glucose, lipid profile and serum creatinine. Ankle – brachial index was measured using the American Heart Association 2005 guidelines. Descriptive statistics were utilized. Multivariate analysis was performed to compare the variables affecting the development of PAD while T – test was used to test for statistical significance.

Results: The prevalence of PAD among CKD patients on hemodialysis was high at 31.25 %, majority of patients were more than 60 years of age at 71.25%, and predominantly males in 56 % of cases. Nine subjects, 36 % had normal BMI whereas 36 % were overweight among patients with PAD. Hypertension, dyslipidemia and diabetes were the frequently associated comorbidities present in 92%, 64% and 52% of cases respectively. Hypertension Stage 1 in 36% and stage 2 in 24% were observed. Dyslipidemia was a significant risk factor associated with PAD with a p value 0.02.

Conclusions: The prevalence of PAD was 31.25% among patients with CKD on hemodialysis. Dyslipidemia posed a significant risk factor associated with PAD. Longitudinal research is recommended on routine use of ABI for screening of PAD among CKD patients and introducing medical and therapeutic intervention to improve patients' outcomes.

Table 1 and 2

Table 1. Baseline Characteristics of the 80 CKD Patients on Hemodialysis in RTRH

Characteristics	Frequency			
	With PAD	Percentage (%)	Without PAD	Percentage (%)
Age (in years)				
Below 60	10	40 %	31	56.36 %
Above 60	15	60 %	24	43.63 %
Gender				
Male	14	56 %	26	47.27 %
Female	11	44 %	29	52.72 %
BMI				
Underweight	1	4 %	6	10.9 %
Normal	9	36 %	23	41.8 %
Overweight	9	36 %	13	23.63 %
Obese	6	24 %	13	23.63 %
Blood Pressure				
Normal	10	40 %	21	38.18 %
HPN Stage 1	9	36 %	15	27.27 %
HPN Stage 2	6	24 %	19	34.54 %
Duration of hemodialysis				
Less than 1 year	9	36 %	16	29.09 %
More than a year	16	64 %	39	70.9 %
Total number	25	31.25 %	55	68.75 %

As shown in Table 2, the predominant comorbidities seen among patients with PAD was hypertension in 92% of patients followed by dyslipidemia present in 64% of cases and diabetes in 52% of cases.

Table 2. Associated comorbidities of CKD patients on hemodialysis with and without PAD.

RISK FACTORS	FREQUENCY N=25 WITH PAD	PERCENTAGE (100 %) WITH PAD	FREQUENCY N=55 WITHOUT PAD	PERCENTAGE (100%) WITHOUT PAD
Diabetes Mellitus	13	52 %	12	21.81 %
Hypertension	23	92 %	46	83.63 %
Obesity	8	32 %	15	27.27 %
Smoker	8	32 %	23	41.81 %
Dyslipidemia	16	64 %	53	96.36 %
CAD	5	20 %	3	1.81 %
Stroke	1	4 %	3	1.81 %

This study highlights the importance of screening CKD patients for PAD utilizing the ABI tool as they are at high risk for developing PAD based on age, presence of atherosclerotic risk factors such as diabetes, hypertension, dyslipidemia and reduced renal function.

Table 3

Table 3. Biochemical Profile of patients with and without PAD

Biochemical Profile	Total Mean	With PAD (Mean)	Without PAD (Mean)	P value
FBS	100.89	108.3	97	0.2
Total cholesterol	153.8	139.5	158.5	0.2
Triglyceride	145.7	162	136.8	0.15
LDL-C	93.5	69.6	106.5	0.06

As to biochemical profile shown in Table 3, none of the laboratory variables showed statistically significant association with Peripheral Arterial Disease. A LDL-C level of 69.6 was a significant laboratory parameter associated with PAD; although it was not statistically significant, with a p value of 0.06.

Table 4. Regression Analysis on Risk Factors Associated with an abnormal ABI in patients with CKD on Hemodialysis

Risk Factors	Unstandardized Coefficients		Standardized Coefficients	t	P-value
	B	STD Error	Beta		
Constant	1.537	.348		4.418	.000
Age	.000	.003	-.006	-.042	.967
Sex	-.027	.134	-.036	-.023	.840
Weight (in kilograms)	.050	.040	1.349	1.246	.217
Body Mass Index	-.072	.053	-.1.421	-1.357	.179
History of Smoking (yes/no)	.103	.106	.135	.975	.333
Hypertension (In Years)	-.005	.005	-.140	-.910	.366
Diabetes Mellitus (in years)	-.007	.007	-.159	-1.018	.313
Dyslipidemia (In Years)	.036	.015	.344	2.362	.021
Cardiovascular Disease (yes/none)	.036	.122	.037	.295	.769
Duration of Hemodialysis (In years)	.036	.022	.201	1.619	.110

Dependent Variable: Ankle-Brachial Index

Table 4 summarizes the results of the multivariate regression analyses of the risk factors associated with abnormal ABI in patients with CKD on hemodialysis. The results showed that dyslipidemia was the only significant risk factor associated with the presence of peripheral arterial disease (PAD) with a p value of 0.021. The positive coefficient of dyslipidemia suggests a positive association with abnormal ABI and that, as dyslipidemia increase the risk of an abnormal ABI also increases. The other risk factors may be associated with abnormal ABI but were not statistically significant in this investigation.