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Factors influencing the onset of cardiovascular disease according to chronic kidney disease stages: A multi-center Prospective cohort

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Introduction: Patients with Chronic Kidney Disease (CKD) present a high risk of mortality compared to the general population of the same age [1]. The onset of a kidney disease in a patient with pre-existing cardio-vascular (CV) disease worsens the outcome and represents a major cause of morbi-mortality [3]. In addition, echocardiographic abnormalities, including left ventricular hypertrophy (LVH), left ventricular dilation and systolic dysfunction are common in CKD and are responsible for excess CV mortality, even in asymptomatic patients. The aim of our work was to determine the prevalence of CVCs as well as CV risk factors correlated with the occurrence of these complications.

Methods: This is a prospective analytical study, conducted from January 2021 to January 2022, including patients with CKD in the nephrology department of Mohammed VI University hospital of Oujda-Morocco. Epidemiological, clinical, para clinical, and echocardiographic dada were collected. We divided our patients into two groups depending on whether or not CVCs are present. Statistical analysis was performed using SPSS software 2020 for Windows. A value $p < 0.05$ is considered significant.

Results

Table I: Patient Characteristics

Characteristics	Results (n=200)
Mean age (year)	55,64±18,9
Sex ratio (H/F)	1,38
Cardiovascular risk factors:	
Age>65 years	32%
Male Sex	58%
HBP	62,2%
Diabetes	40,5%
Dyslipidemia	37,7%
Smoking	18,1%
Sedentary	87,4%
Anemia	87,8%
Secondary Hyperparathyroidism	89,1%
Initial Nephropathy:	
Diabetic Nephropathy	38,6%
Undetermined Nephropathy	13,4%
Vascular nephropathy	8,9%
Glomerular Nephropathy	6,9%
Interstitial Nephropathy	5%
APKD	2,5%
Vascular Nephropathy	2%
Stages of CKD	
I	2%
II	3%
IIIA	2%
IIIB	5,4%
IV	10%
V	21%
VD	56,6%

HBP: high blood pressure , CKD :chronic kidney diseases, stage VD : chronic dialysis

Table 2 : Echocardiographic abnormalities

Stage of CKD	LVH	Pericardiac Effusion	Valvulopathy	Hypokinesia	RVH	Valvular calcifications	Atrial Septum Aneurysm
Stage I	5,3%	0%	0%	0%	0%	0%	0%
Stage II	3,5%	0%	0%	0%	0%	0%	0%
Stage IIIA	1,1%	0,3%	3%	3,3%	8%	0%	0%
Stage IIIB	4,2%	3%	7%	10%	12%	0%	0%
Stage IV	8,7%	4 ,5%	10%	20%	30%	0%	0%
Stage V	26,3%	2%	20%	16,7%	20%	30%	20%
Stage VD	50,9%	90,2%	60%	50%	30%	70%	80%

LVH: Left Ventricular Hypertrophy, RVH: Right ventricular hypertrophy

Factors influencing the occurrence of CV complications in our population were an age > 65 years ($p < 0.05$), diabetes ($p < 0.05$), hypertension ($p < 0.05$), smoking ($p < 0.05$) for all stages of CKD, while anemia and secondary hyperparathyroidism were significant only for CKD stage IV and V ($p < 0.05$).

Conclusion: CVC are frequent in CKD patients. Hence, early diagnosis & management of the risk factors linked to these complications are crucial.

References
1-Hamada S, Gulliford MC. BMJ Open 2018;8:e019950.
2-Tonelli M, Muntner P, Lloyd A, et al. J Am Soc Nephrol 2013; 24(6):979–986.