LEAN TISSUE IS AN INDEPENDENT MORTALITY FACTOR IN PATIENTS WITH STAGE 4 CHRONIC KIDNEY DISEASE

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OBJECTIVES

Purpose:
Patients with stage 4 chronic kidney disease have a higher mortality rate compared to general population. Several factors related to mortality have been studied. Corporal composition may influence mortality. Attending to corporal composition, fat tissue has shown a relation with mortality in general population and in chronic kidney disease. However, although lean tissue has been associated with young patients and has been considered as a marker of healthy, it has not yet been analyzed the impact in chronic kidney disease.

Our objective was to evaluate the effect of corporal composition in mortality in a population of stage 4 chronic kidney disease.

METHODS

This is a retropective study. We included 356 stage 4 CKD patients.
We collected baseline characteristics and cardiovascular events.
We analyzed inflammation and nutrition status with laboratory parameters.
Body composition was analyzed by spectroscopic bioimedance (BIS).

We analyzed corporal composition. We collected lean tissue index (LTI), fat tissue index (FTI) and overhydration (OH).

During a median follow up 22 [3-49] month we collected:
-Cardiovascular events.
-Mortality.

RESULTS

GENERAL BASELINE CHARACTERISTICS	N: 356
Sex (male, %)	64
Age (years)	67±13
Charlson index	7.2±2.7
Diabetes (%)	36
Hypertension (%)	87
Dyslipidemia (%)	72
CKD aetiology (%)	
- Glomerular	23
- Diabetes	19
- Vascular	28
- Interstitial	13
- Polycistic	10
- Others	7
Previous cardiovascular events (%)	
Miocardial Infarction (%)	28
CHF (%)	27
Ictus (%)	15
PVD (%)	12

	N: 356
Laboratory parameters	
Creatinine (mg/dL)	3.5±1.5
CKD-EPI (mL/min/1.73m²)	16±5.5
Proteinuria (g/24h)	0.5 (0.2-1.5)
Albumin (g/dL)	4.1±0.4
Nt-proBNP (ng/dL)	84 (37-181)
CRP (mg/dL)	0.3 (0.1-0.7)
Prealbumin (mg/dL)	32 (27-38)
Hydration statement and corporal composition	
BMI (Kg/m²)	28.0±5.2
FTI(Kg/m²)	12.3±5.6
LTI (Kg/m²)	15.7±3.4
OH (L)*	0.6 (-0.4-1.5)
ECW (L)	17.0±3.5
ICW (L)	19.7±4.7
ECW/ICW	0.8±0.1
OH/ECW (%)	2.3±0.8

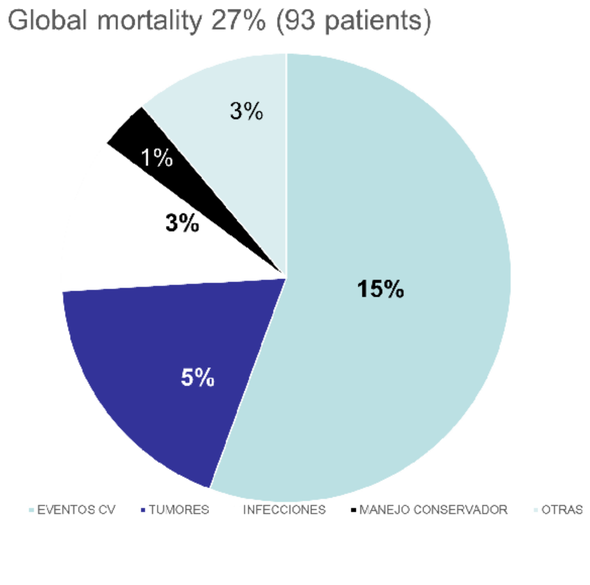
Abrev.: CKD: chronic kidney disease. CHF: congestive heart failure. PVD: Peripheral vascular disease. MDRD: MDRD equation to estimate glomerular filtration rate. Nt-ProBNP: N-terminal prohormone of brain natriuretic peptide. CRP: C-reactive protein. BMI: body mass index. FTI: fat tissue index. LTI: lean tissue index. OH: overhydration. ECW: extracellular water. ICW: intracellular water.

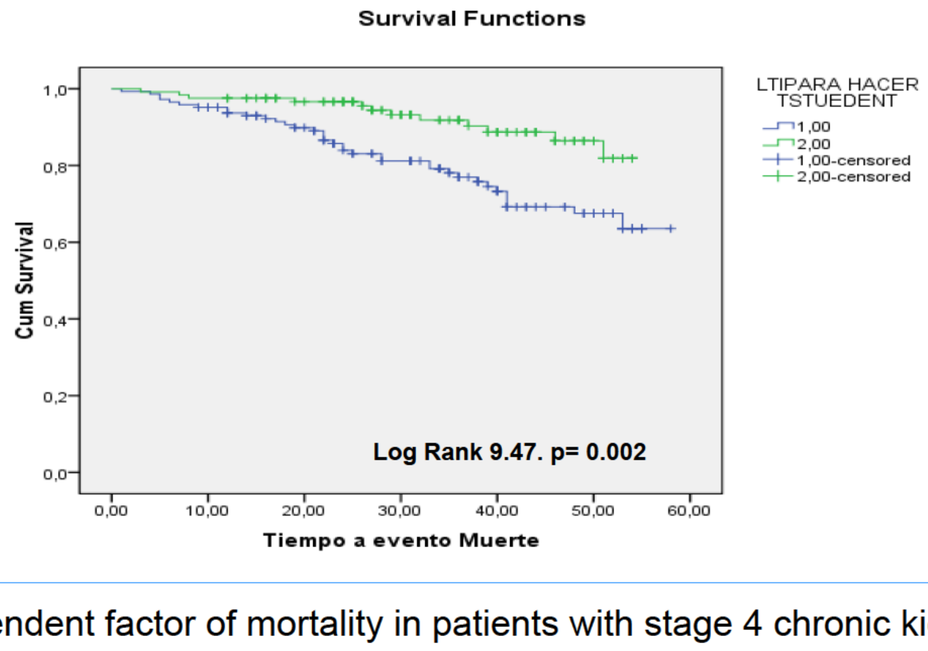
Univariate analysis for lean tissue index.

	LTI<15.7 Kg/m²	LTI>15.7 Kg/m²	P
Age (years)	71.3±11.8	61.8±14.2	0.001
Charlson Index	7.6±2.3	6.9±3.2	0.04
BMI (Kg/m²)	27.5±5.1	28.9±4.9	0.015
OH (L)	0.79± 0.05	0.39±0.06	0.003
ICW (L)	16.6±12.2	23.2±10.7	0.002
Proteinuria (g/24 h)	848.9±127.8	1239±539.7	0.03
ProBNP (ng/dL)	276.5±65.9	105.5±23.6	0.046
CRP (mg/dL)	0.70±0.02	0.48±0.03	0.027

Univariate and mulivariate analysis for mortality

	HR (95% CI) UNIVARIATE	P	HR (95%CI) MULTIVARIATE	P
Age (years)	1.04 (1.02-1.05)	0.001	1.02 (1.00-1.04)	0.05
Charlson index	1.24 (1.14-1.36)	0.001	1.21 (1.05-1.40)	0.01
Previous global CVev	1.34 (1.20-1.57)	0.02	1.27 (0.98-1.43)	0.44
Creatinine (mg/dL)	1.02 (0.89-1.18)	0.34		
Proteinuria (g/24 h)	1.001 (0.99-1.01)	0.69		
Albumin (g/dL)	0.41 (0.21-0.81)	0.011	0.84 (0.68-1.12)	0.54
Prealbumin (mg/dL)	0.95 (0.92-0.99)	0.025	0.99 (0.89-1.23)	0.31
CRP (mg/dL)	1.44 (1.18-1.74)	0.001	1.23 (0.92-1.43)	0.75
Nt-proBNP (ng/dL)	1.00 (0.99-1.01)	0.677		
Colesterol	0.99 (0.98-1.01)	0.07		
OH (L)	1.13 (1.01-1.27)	0.028	1.10 (0.99-1.20)	0.08
ECW (L)	0.96 (0.88-1.05)	0.640		
ICW (L)	0.88 (0.81-0.94)	0.001	1.01 (0.91-1.17)	0.09
ECW/ICW	2.45(2.01-3.62)	0.001	1.43 (0.95-2.29)	0.22
BMI (Kg/m²)	0.98 (0.93-1.04)	0.650		
FTI(Kg/m²)	1.04 (0.89-1.08)	0.124		
LTI (Kg/m²)	0.79 (0.71-0.89)	0.001	0.82 (0.69-0.98)	0.031





CONCLUSIONS

Low lean tissue is an independent factor of mortality in patients with stage 4 chronic kidney disease.

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