

Nutritional status and impact on mortality in hemodialysis patients

Authors: **Helena Pinto, Maria Guedes-Marques, Pedro Maia, Pedro Ponce.**
Institution: **Nephrocare Coimbra, medical department.**



Introduction and objectives

Malnutrition and protein-energy wasting (PEW) are common in hemodialysis patients. Several factors, including the type of vascular access, can influence these parameters. The objective of our study was to evaluate if the nutritional status and the type of vascular access had influence on mortality of hemodialysis patients.

Methods

A retrospective analysis was made and all patients that were on hemodialysis program in our unit by February of 2015 were evaluated. Patients with pacemaker and limb amputations were excluded.

Clinical parameters as gender, age, time on dialysis, type of vascular access, Kt/v and presence of diabetes mellitus were accessed. The body mass index (BMI), dry weight and the body cell mass index (BCMI) of 2015, as well as lean tissue index (LTI) and fat tissue index (FTI), were recorded. In all patients, the assessment of body composition was carried out using the Body Composition Monitor (BCM, Fresenius Medical Care).

Analytical parameters such as hemoglobin, albumin, phosphorus, potassium, normalized protein catabolic rate (nPCR) and Hemoglobin A1c were recorded at baseline.

The primary end-point evaluated was survival during a 2-year period of follow-up. A descriptive analysis was made and SPSS 21.0 was used for statistical analysis of the different continuous and categoric variables. Results with $p \leq 0,05$ were considered statistically significant.

	Mean	Median	Std. Deviation	Minimum	Maximum
Hb	11,094	11,000	1,3508	8,0	16,8
A1c %	6,336	6,200	1,1088	4,5	9,6
Ur	119,32	118,50	30,035	55	222
Creat	7,7790	7,7800	2,25654	1,84	14,00
Na	136,51	137,00	3,011	125	144
K	4,999	5,000	,7660	3,1	7,6
P preHD	4,161	3,955	1,2145	1,5	8,5
Alb	4,006	4,000	,3012	2,6	4,7
PCRn (g/kg/d)	1,1015	1,0900	,23814	,55	1,75
BMI [kg/m ²]	26,922	26,542	5,0243	16,0	48,1
OH (L)	1,685	1,707	1,2737	-1,0	5,4
LTI [kg/m ²]	12,400	12,077	3,1634	6,9	24,1
FTI [kg/m ²]	13,596	13,235	6,2483	1,0	36,3
rel LTM [%]	47,841	46,358	15,7212	21,6	90,0
rel Fat [%]	35,700	36,187	11,7038	3,8	56,4
BCM [kg]	18,166	17,304	6,8739	6,5	44,0

Results and conclusion

Results

From 159 patients, 141 were included, 25 (17.7%) died during the follow-up period.

From this group, 45 (31.9%) patients were diabetic.

The majority of patients had arteriovenous fistulas for vascular access (n=104; 73.8%). Arteriovenous fistulas were associated with lower mortality.

The presence of central venous catheter (CVC) was significantly associated with lower creatinine levels, lower albumin levels, lower LTI, higher FTI and lower BCMI.

The type of access (p= 0.04), the presence of diabetes (p=0.001), the lower hemoglobin levels (p=0.002), the lower albumin levels (p= 0.011) and the lower nPCR levels (p=0.038) had a statistically significant negative impact on mortality.

The value of Kt/v equal or above 1.4 had no impact on survival. Although low FTI (<10%) had negative influence on survival rate, did not attain statistical significance.

Analyzing only the diabetic population, we found a statistically significant relationship between lower creatinine levels (p=0.011), lower albumin levels (p=0.025) and lower nPCR (p=0.017) levels and mortality. We also found that a higher percentage of fat (p=0.039) and a low LTI (p=0.008) had a significant statistical association with mortality, but that was not found regarding BMI.

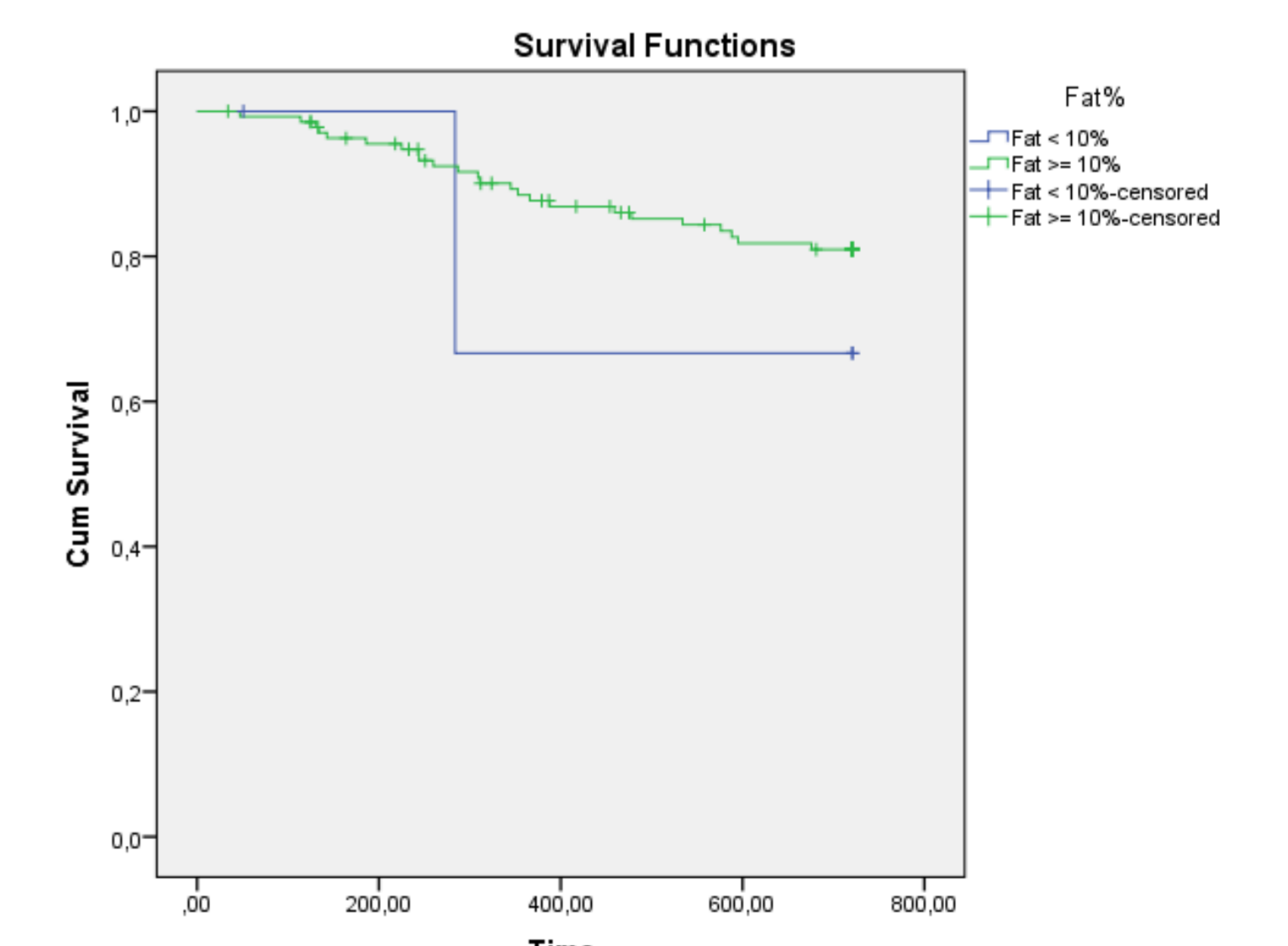
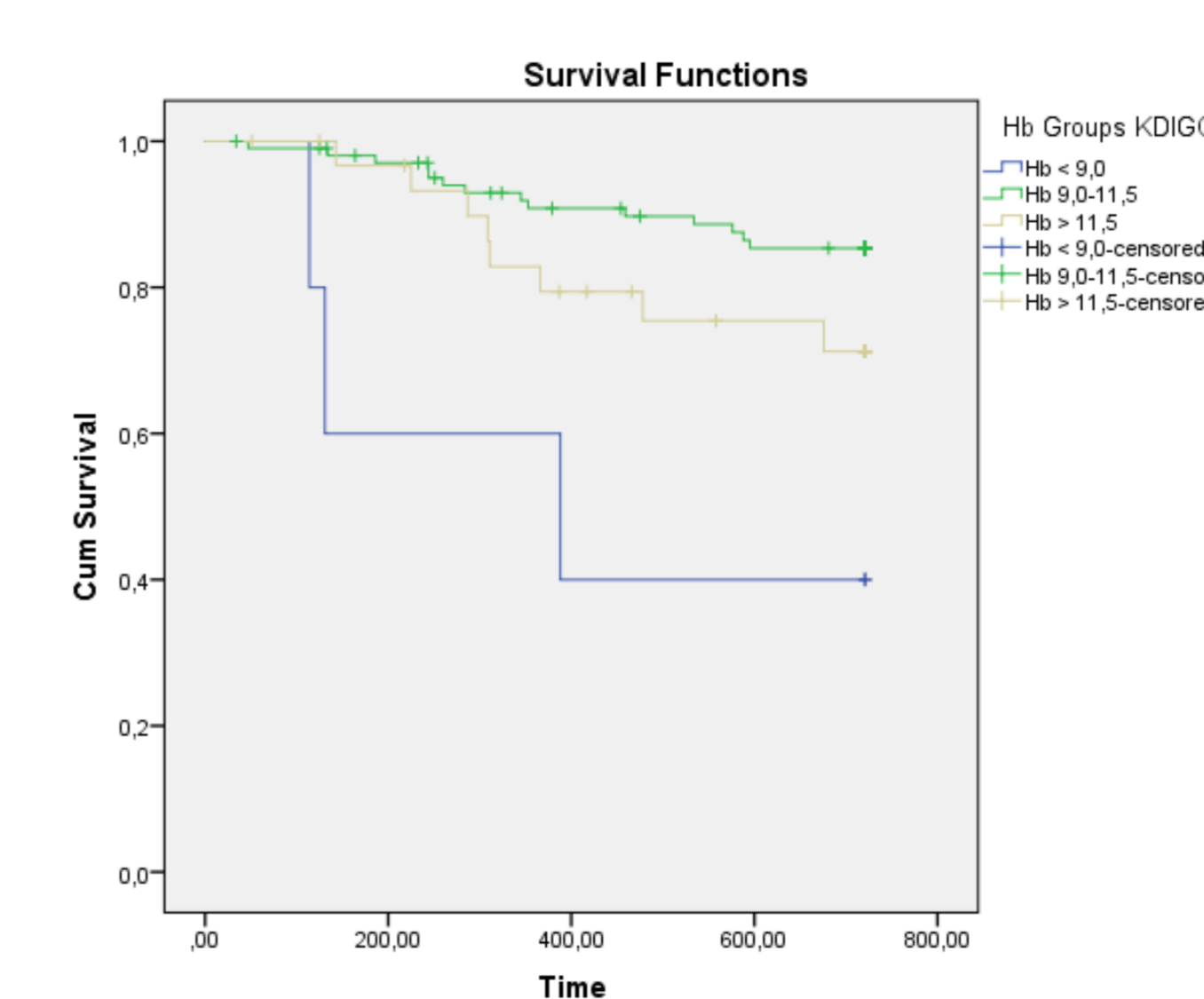
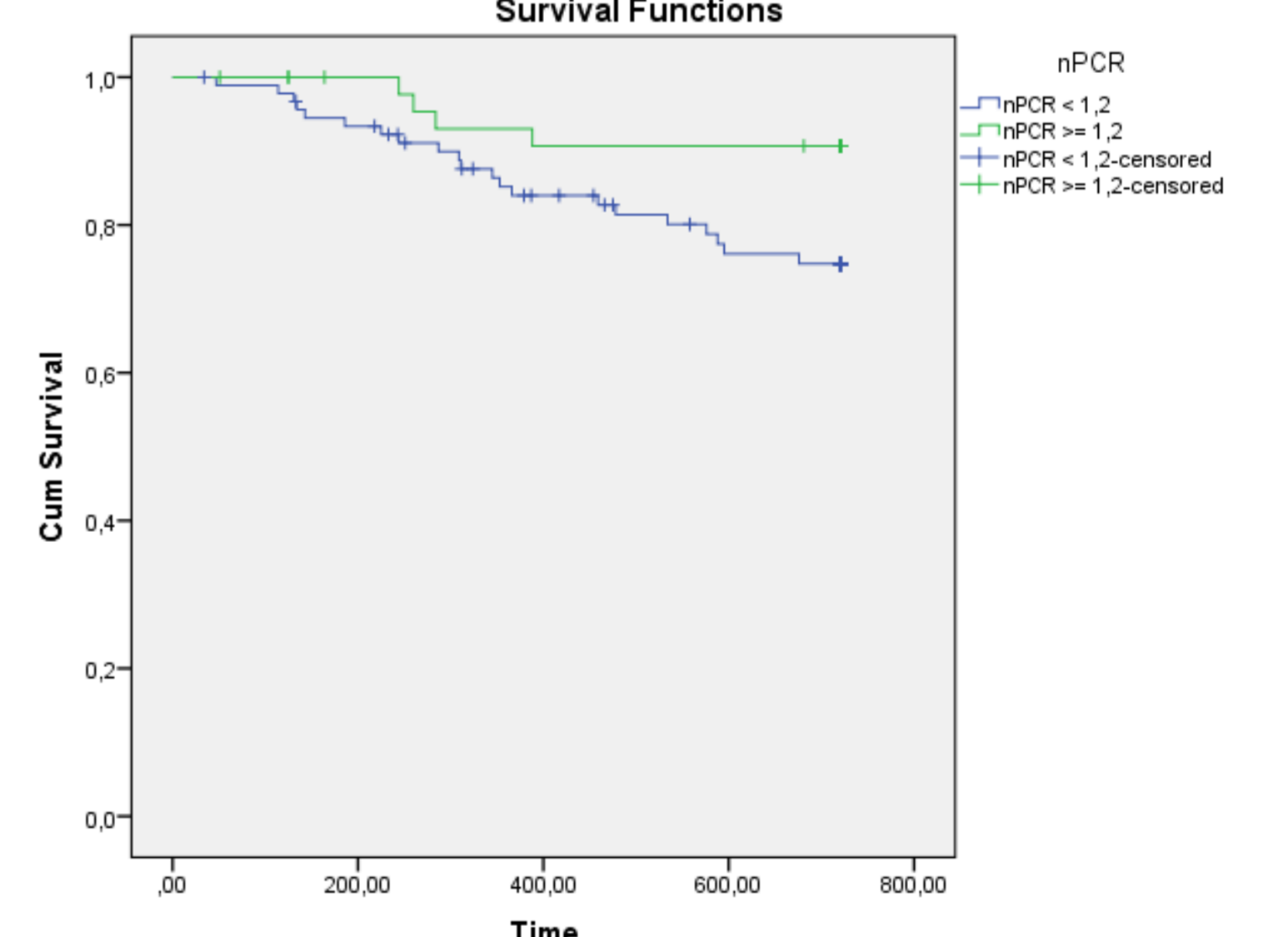
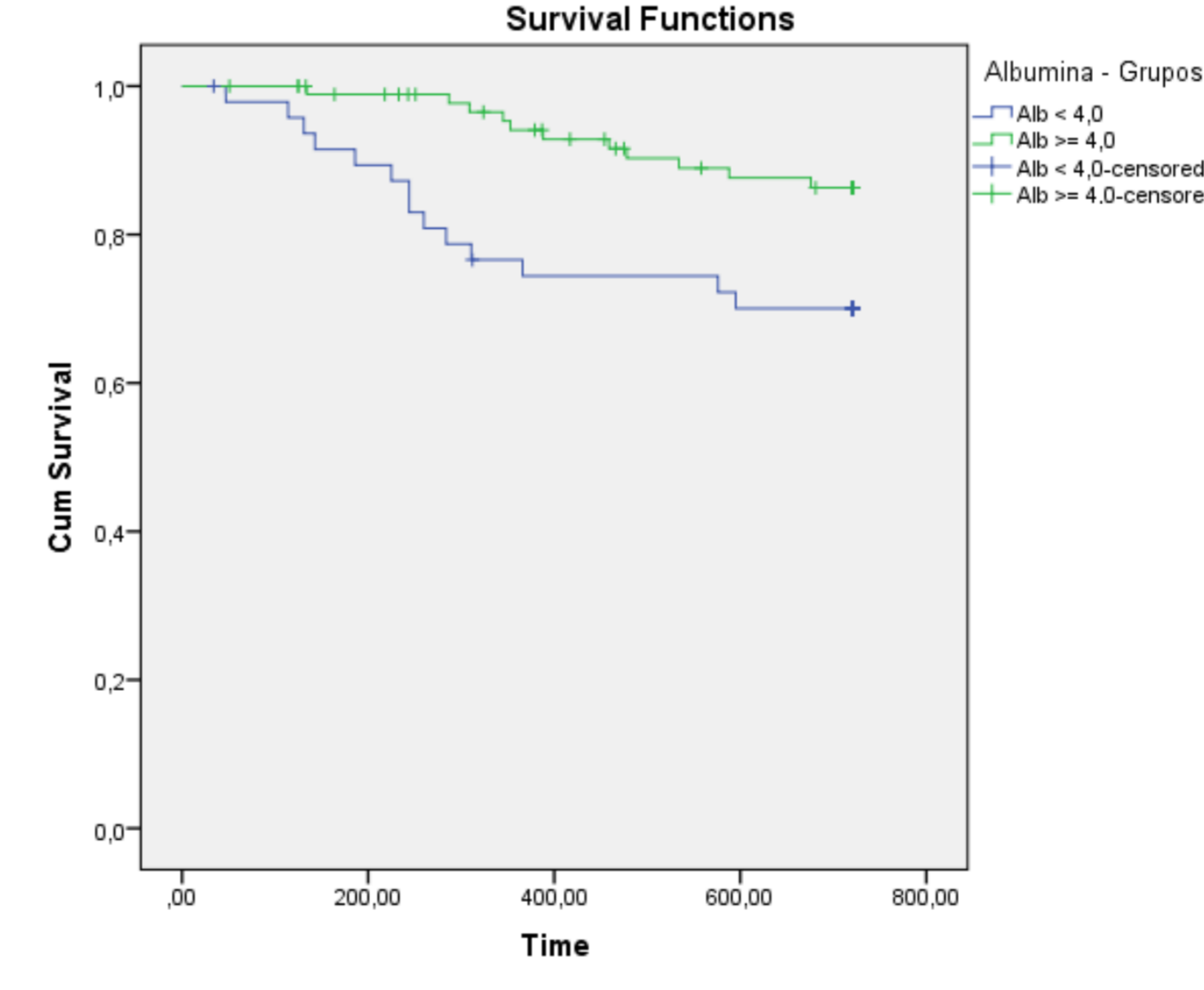
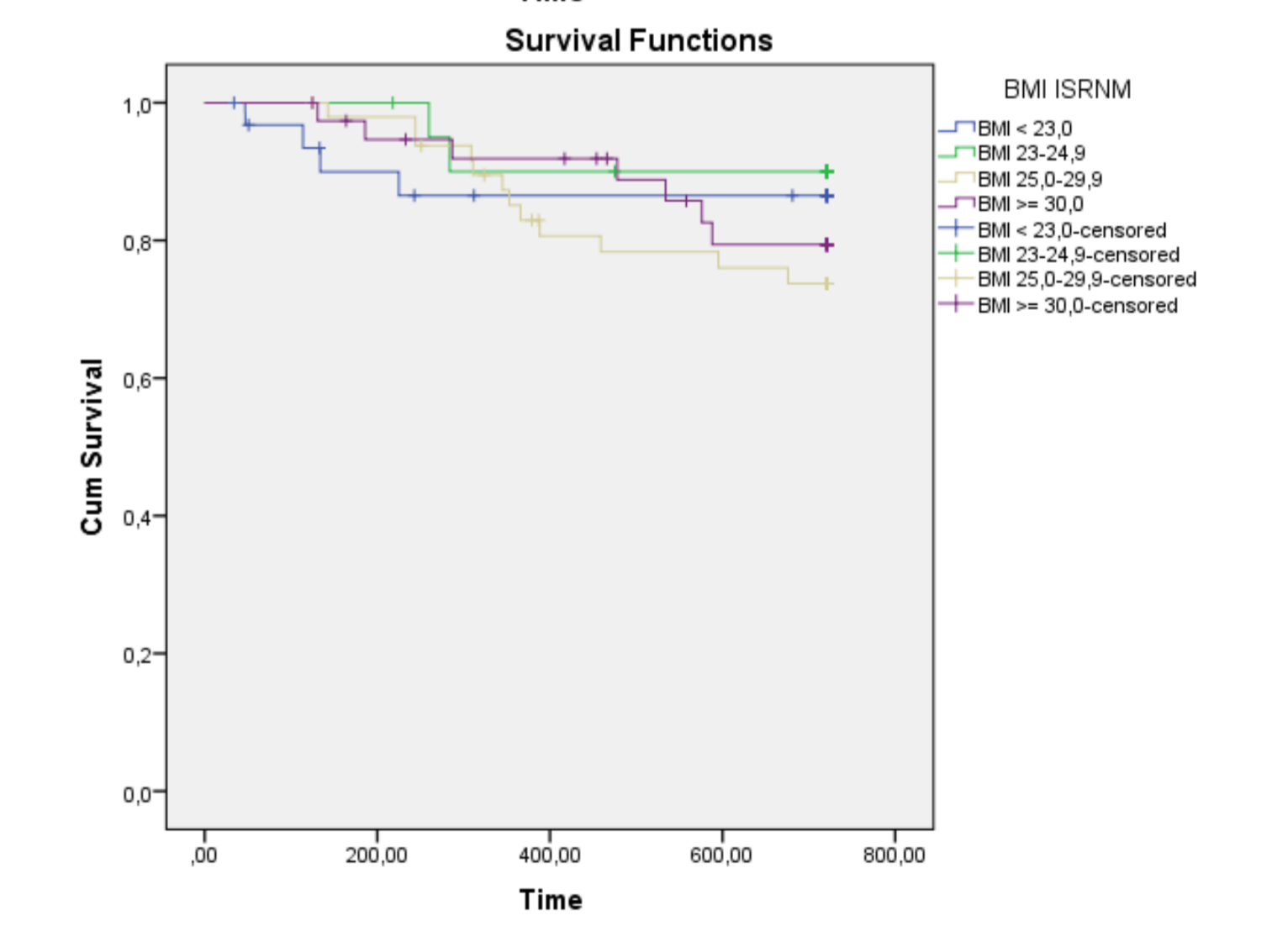
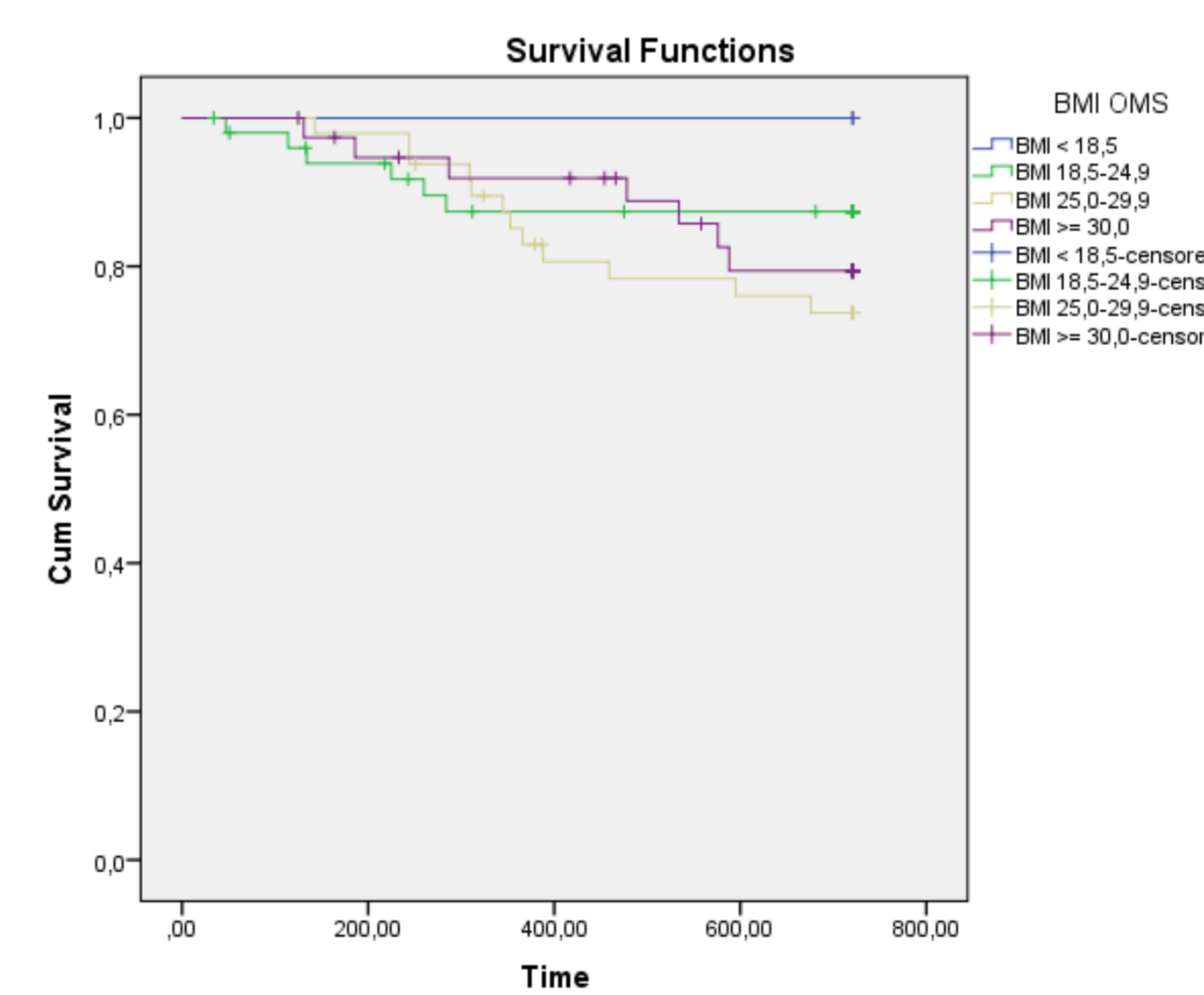
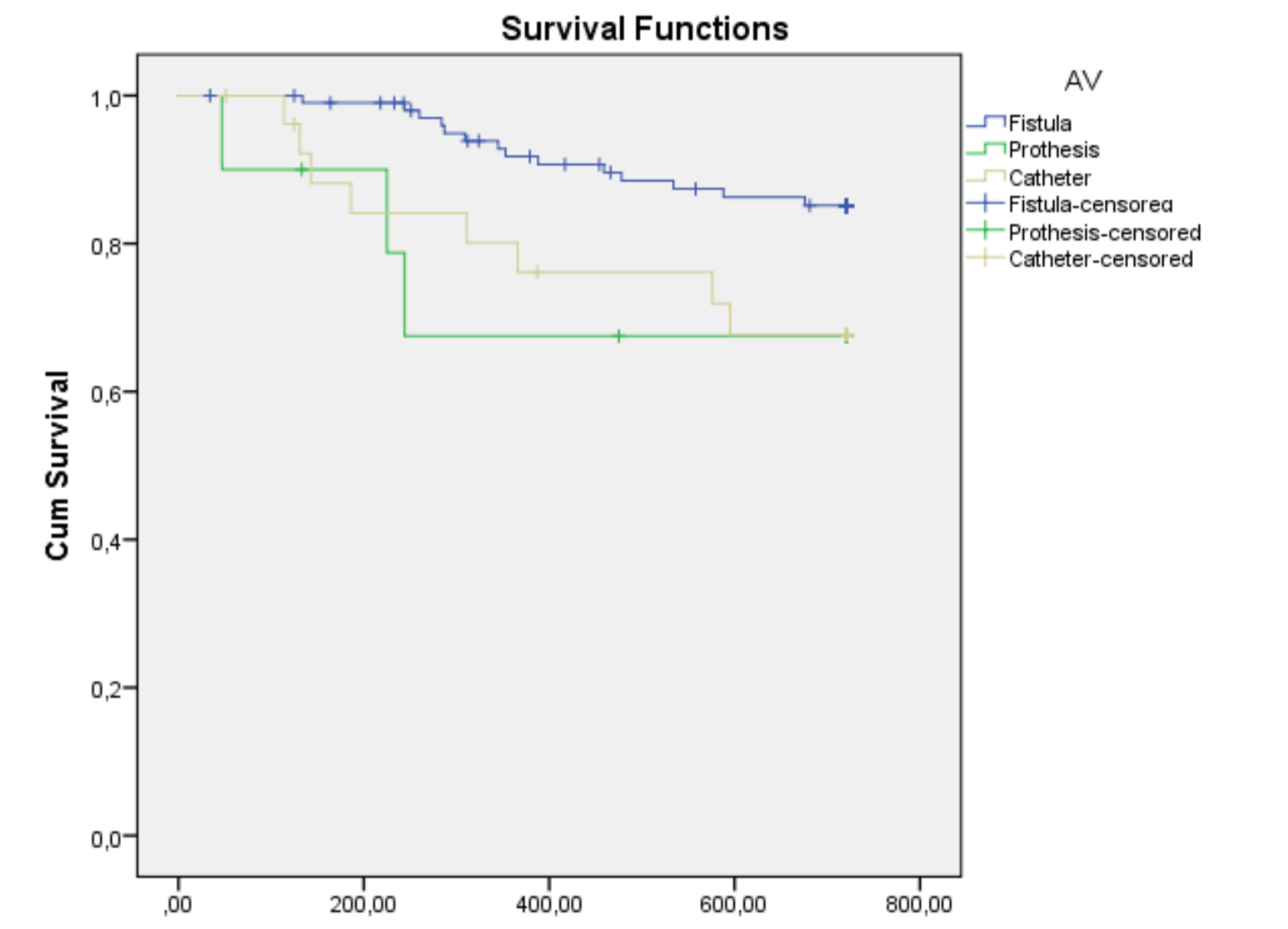
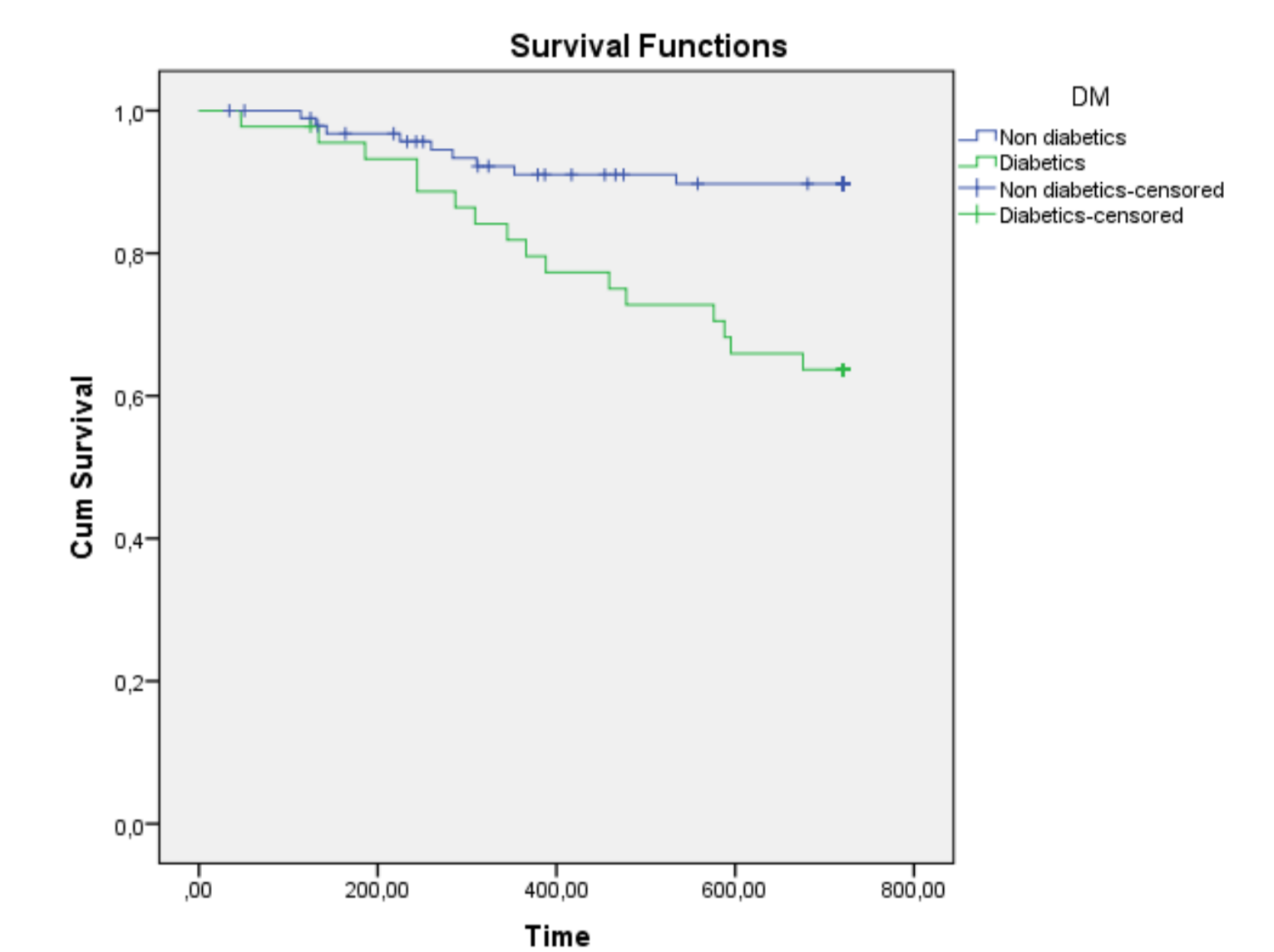
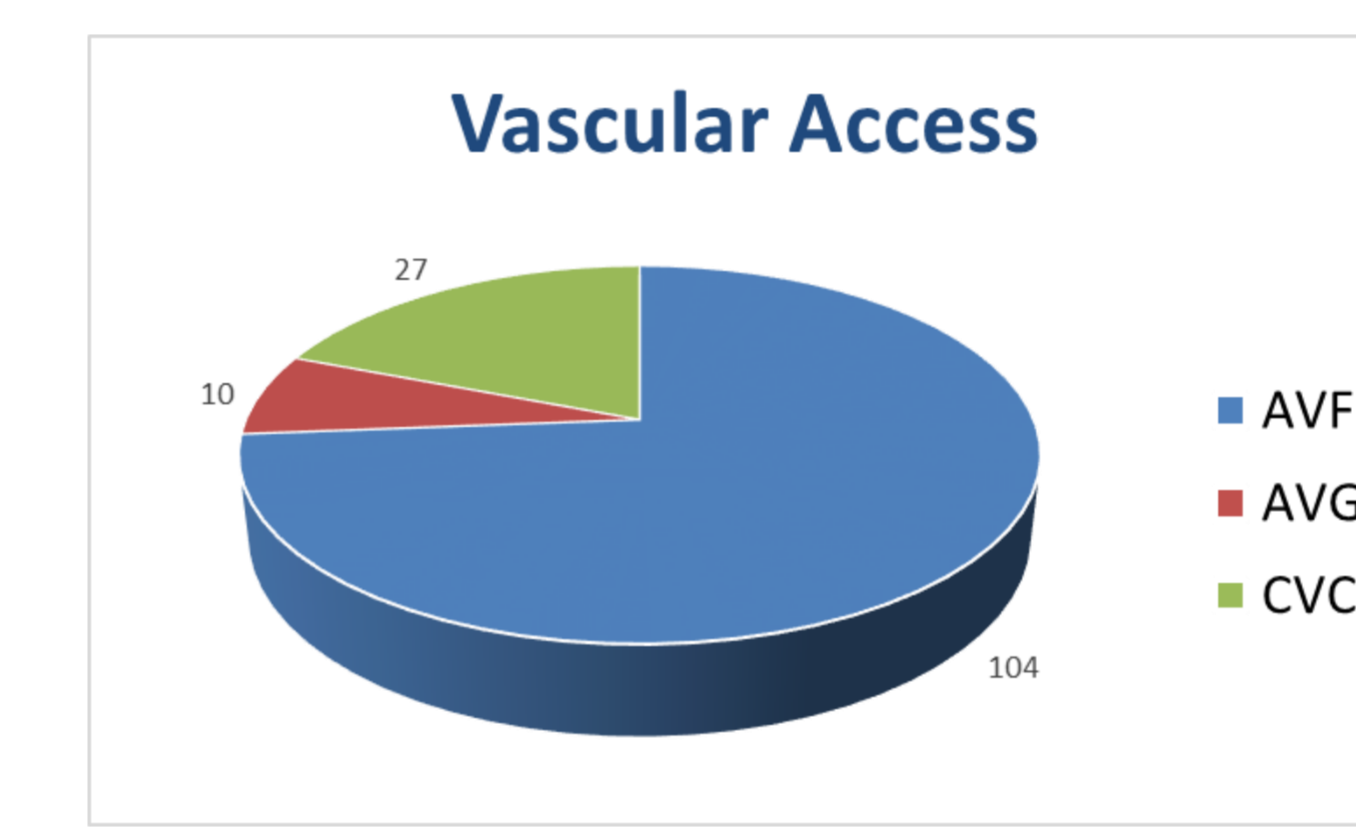
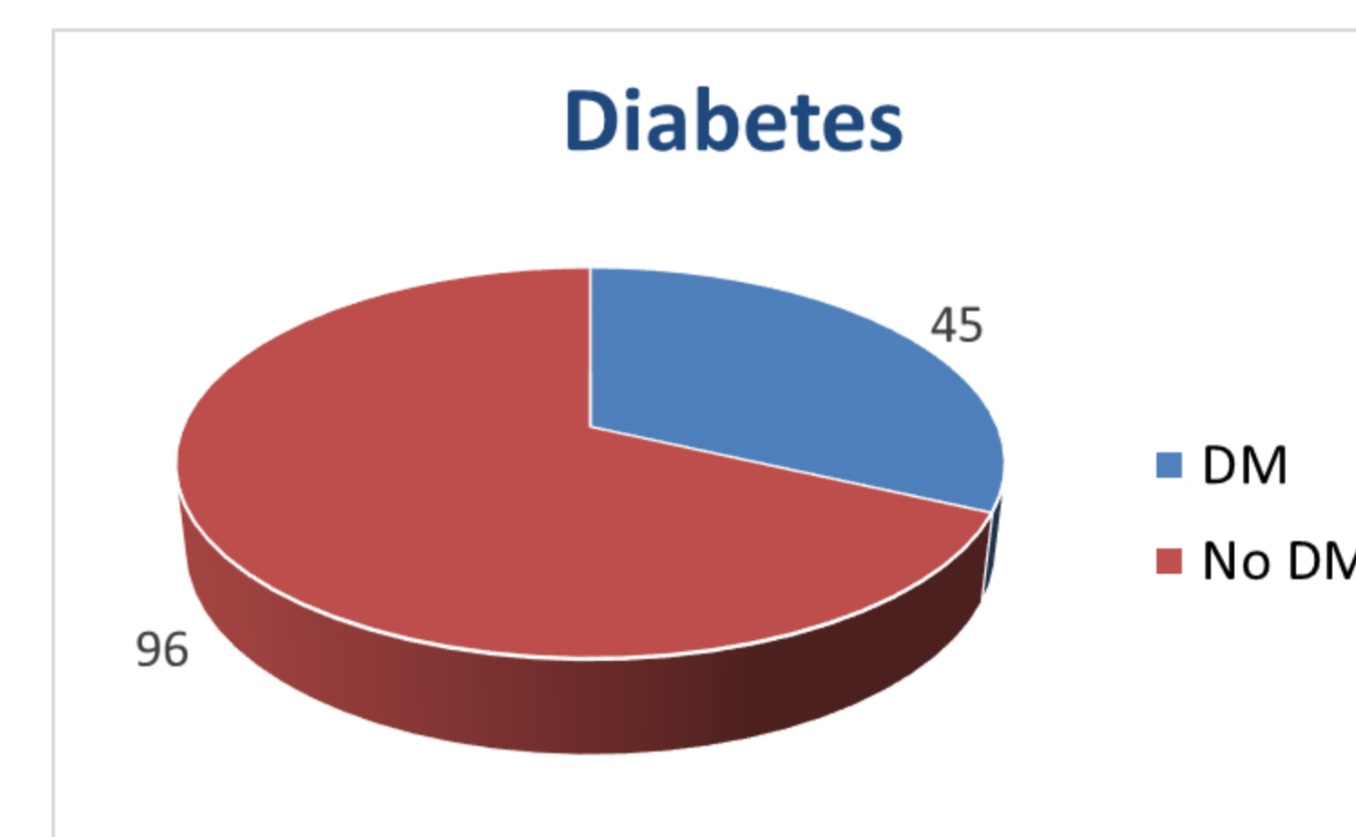
Conclusion

Treatment goals and ideal nutritional parameters on hemodialysis patients are still under discussion. A permissive diet can lead to obesity and hyperphosphatemia. However, malnutrition is also prevalent and has an impact on mortality.

In our study, some markers of malnutrition had a significant adverse impact on patient survival. Some factors, as the presence of diabetes and CVC, were associated with malnutrition parameters and also had a significant impact on mortality.

An interesting fact was that, in diabetic population, only the corporal composition, with lower lean tissue (LT) and higher fat tissue (FT), but not the BMI, was related to higher mortality. This could mean that the diabetic population can be malnourished but have a normal or even high BMI, because the distribution of LT and FT in this population is more asymmetric.

The definition of patients at higher risk and the possibility of therapeutic intervention can lead us to select better targets in order to achieve lower mortality rates in our patients.



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