

MP643

The authors declare no conflicts of interest

Introduction

In hemodialysis (HD) patients, arteriovenous fistula (AVF) has been associated with the improvement of morbimortality related to vascular access management. Nonetheless, the survival benefit of AVF has been questioned.

Aim: Evaluate the clinical impact and burden of building AVF in pre-dialysis patients.

Results

During this time frame, 87 patients remained in pre-dialysis and 91 patients started chronic HD program. Patients main baseline characteristics are described in *table 1*.

Main characteristics of arteriovenous (AV) access placed are described in *table 2*.

Patient's characteristics	Pre-Dialysis	Incident HD	P-value
N	87	91	
Age at referral, mean (SD)	66.8 (14.4)	64.9 (15.1)	0.39
Males	40 (46%)	50 (55%)	0.29
Diabetes	39 (45%)	42 (46%)	0.88
Hypertension	78 (90%)	86 (95%)	0.27
Arterial peripheral disease	19 (22%)	15 (16%)	0.45
Ischemic Cardiac Disease	24 (28%)	21 (23%)	0.50
Cerebrovascular Disease	27 (31%)	29 (32%)	1.00
Chronic Kidney Disease etiology			
Unknown	10 (11%)	10 (11%)	
Diabetic nephropathy	23 (26%)	29 (32%)	
ADPKD	10 (11%)	8 (9%)	0.93
Chronic GN	15 (17%)	18 (20%)	
Ischemic nephropathy	10 (11%)	8 (9%)	
Others	19 (22%)	18 (20%)	
Follow up time by a Nephrologist (years), median (IQR)	4.8 (2.9,10.0)	3.6 (1.7, 8.6)	0.011
Estimated GFR, median (IQR) (ml/min/1.73m²)^b	4.1 (3.7, 4.6)	4.6 (3.8, 5.4)	0.002
Patient follow-up time (months), median (IQR)	146.5 (88.1, 305.7)	137.7 (84.1, 317.3)	0.95
Patient survival (rate)	66 (76%)	64 (70%)	0.50

Table 1. Characteristics of patients referred for vascular access assessment.

^aPatients who remained pre-dialysis and patients who started chronic hemodialysis program at the end of the follow-up of this study.
^b Estimated Glomerular Filtration Rate (GFR) at referral using The Modification of Diet in Renal Disease equation.
Data presented as mean ± SD (standard deviation), median (interquartile range), or frequency (percent), as appropriate. GN: glomerulonephritis; ADPKD: autosomal dominant polycystic kidney disease; a p-value<0.05 was considered statistically significant.

Methods

We conducted a retrospective study of all patients with non-end stage renal disease referred for vascular access building between January 2014 and December 2015 at Centro Hospitalar do Porto. A total of 178 patients were included, clinical and laboratorial data, doppler ultrasound (DU) evaluation and AVF complications were collected. The end of AVF follow-up was first of November of 2016 for those who didn't start HD and start of HD for those who engaged chronic HD program, or time of death for both groups. Chi-square test and Wilcoxon rank-sum test were used as appropriate. Multivariate analysis was performed using Cox regression. Statistical analysis was performed using Stata/IC 14.0.

Vascular access characteristics	Pre-Dialysis	Incident HD	P-value
N	87	91	
AV access placed			
Radio-cephalic fistula	44 (51%)	42 (46%)	0.28
Brachio-cephalic fistula	34 (39%)	31 (34%)	
Brachio-basilic fistula	9 (10%)	17 (19%)	
Graft	0 (0%)	1 (1%)	
Drainage vein diameter (cm)^a, median (IQR)	3.2 (2.8, 3.95)	3.3 (2.7, 4.4)	0.36
Nurtering artery diameter ^a(cm), median (IQR)	3 (2.6, 4.2)	3.4 (2.7, 4.5)	0.11
First complication	43 (49%)	51 (56%)	0.74
Primary failure	12 (14%)	13 (14%)	
Juxta-anastomosis stenosis	6 (7%)	8 (9%)	
Drainage vein stenosis	6 (7%)	8 (9%)	
Central venous stenosis	1 (1%)	0 (0%)	
Thrombosis	12 (14%)	7 (8%)	
Steal syndrome	4 (5%)	3 (3%)	
Others	3 (3%)	1 (1%)	
Number of procedures^b, median (IQR) / mean (SD)	0 (0,0) / 0.2 (0.5)	0 (0,1) / 0.3 (0.6)	0.03
Number of thrombosis, median (IQR) / mean (SD)	0 (0, 1) / 0.3 (0.5)	0 (0, 0) / 0.1 (0.3)	0.02
Number of AV access placed^b, median (IQR) / mean (SD)	1 (1, 2) / 1.4 (0.7)	1 (1, 1) / 1.2 (0.4)	0.02
First AV access placed equal to AV access at HD start	-	46 (67%)	-
AV access survival (rate)^b	48 (55%)	61 (67%)	0.12

Table 2. Main AV access characteristics.

^a Doppler ultrasound assessment at nephrologist visit for arterio-venous (AV) fistula planning.
^b Before HD initiation or the end of follow-up.
Data presented as mean ± SD (standard deviation), median (interquartile range), or frequency (percent), as appropriate. A p value< 0.05 was considered statistically significant.

In a **multivariate analysis** including gender, age, Ischemic Heart Disease (IHD), Peripheral Arterial Disease (PAD), Cerebrovascular Disease (CVD), diabetes, vascular access at the beginning of HD and antithrombotic therapy, **only age (HR 1.04, 95% CI 1.0-1.1, p=0.032) and functioning AVF at the start of HD (HR 0.11, 95% CI 0.04-0.63, p=0.008) were significantly associated with mortality, while IHD (HR 2.0 95% CI 1.0-3.95, p=0.047) showed a trend.** Furthermore, only thrombosis (HR 10.6, 95% CI 5.7-19.8, p<0.0001), IHD (HR 1.9, 95% CI 0.9-3.7, p=0.078) and arterial diameter at DU before access placement (HR 1.83, 95% CI 0.9-32.0, p=0.067) indicated a trend towards significance as predictors of AVF survival.

Patient Kaplan-Meier survival estimates can be observed in *figure 1*.

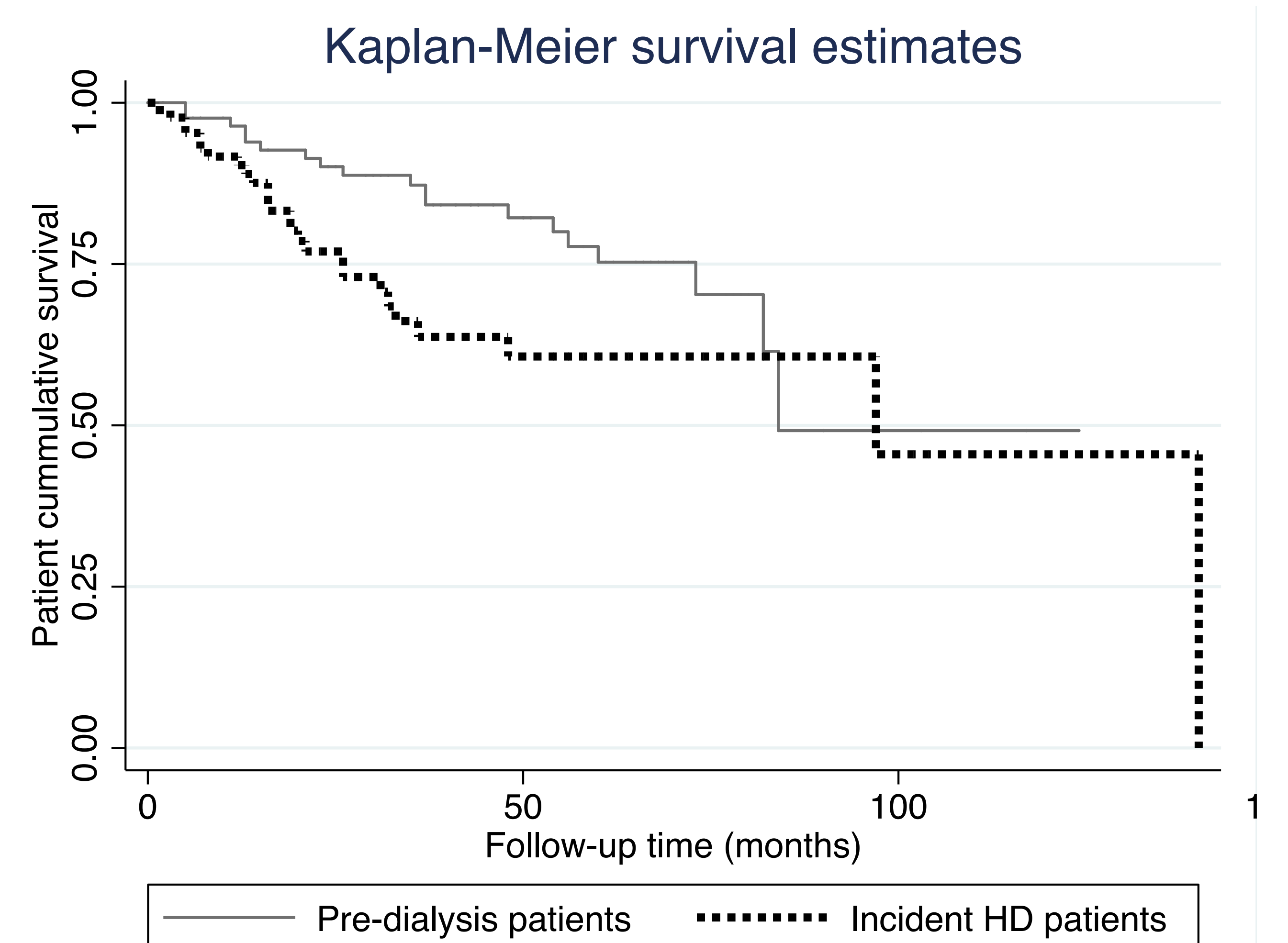


Figure 1. Patients' Kaplan-Meier survival curves.

Conclusions

- Age, IHD and functioning AVF at the beginning of HD can be valuable predictors of mortality and useful for vascular access placement decision.
- Although AVF at the beginning of HD correlates to better outcome, a significant number of patients didn't benefit from it and considerable morbidity was associated to its placement.

References:

- 1 - Ahmed A. Al-Jaishi, Vascular Access Creation before Hemodialysis Initiation and Use: A Population-Based Cohort Study. Clin J Am Soc Nephrol. 2015 Mar 6; 10(3): 418-427.
- 2- Brown et al. The Survival Benefit of "Fistula First, Catheter Last" in Hemodialysis Is Primarily Due to Patient Factors. J Am Soc Nephrol. 2017 Feb;28(2):645-652.