Left ventricular function does not predict all-cause mortality in incident hemodialysis patients

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OBJECTIVES

Creating vascular access in patients who have poor left ventricular function is considered to be harmful for those with end-stage renal failure. To address this problem, we assessed left ventricular function prior to hemodialysis initiation and all-cause mortality in incident hemodialysis patients.

METHODS

Study setting and patient population

- This is a retrospective analysis of incident hemodialysis (HD) patients who underwent echocardiographic examination and vascular access creation prior to HD initiation.
- Patients who had initiated hemodialysis between 1 April 2005 and 1 December 2016 at our hospital and affiliated clinics were included in this study.
- Left ventricular ejection fraction (EF) was assessed as a parameter of left ventricular function.
- This study was approved by the local review board at Tsuchiya General Hospital.
- Conflict of interest statement: None to declare.

METHODS

Follow-up and definitions

- All patients were followed until they reached a study endpoint which included: (i)death; (ii) end of analysis period (-the first December 2016); or (iii) inability to follow up.

Statistical analysis

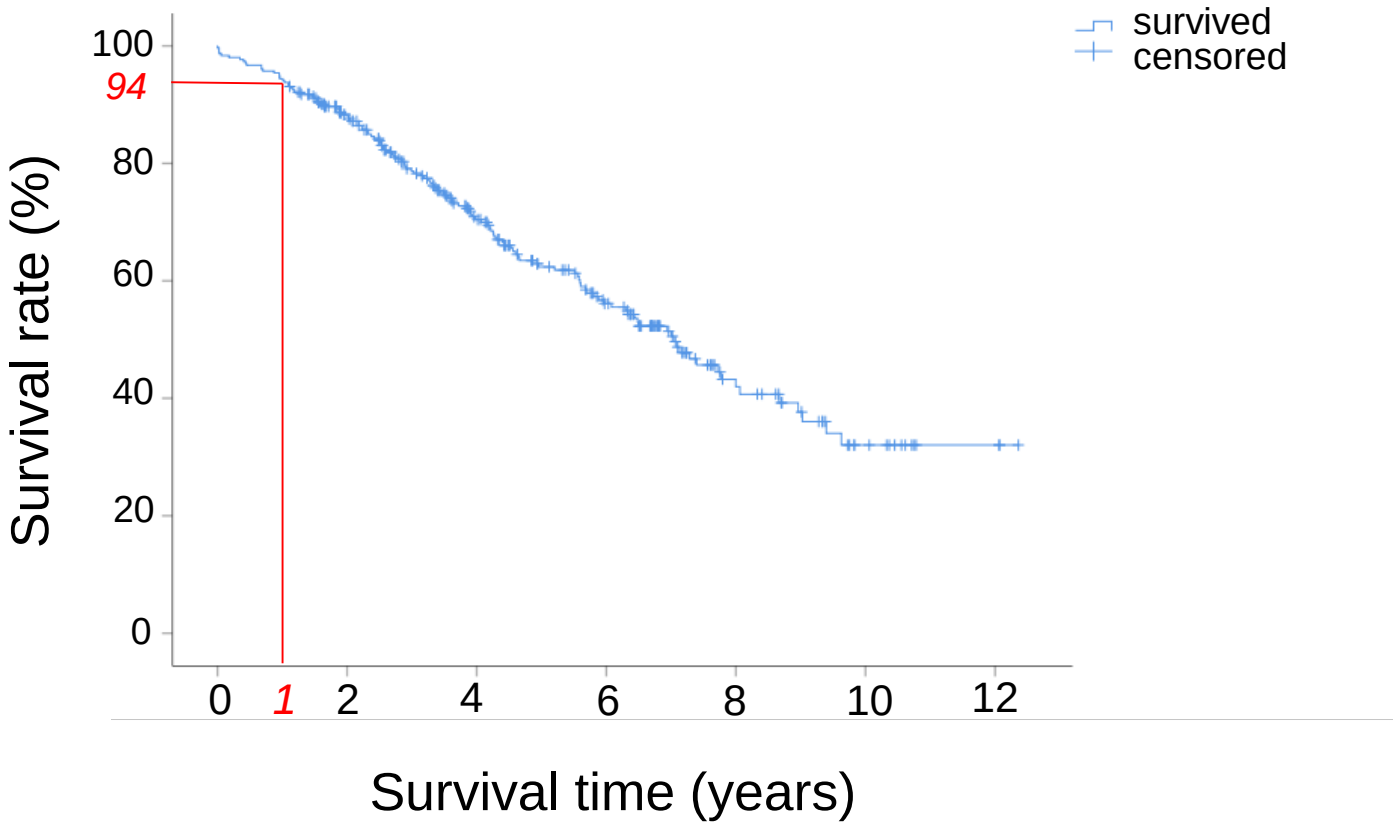
- Patient survival was assessed by the Kaplan-Meier method.
- Adjustments were made using Cox regression analysis for calculating hazard ratios.
- A value of $P<0.05$ was considered significant. The JMP software package for Windows was used for statistical calculations.

Patient demographics

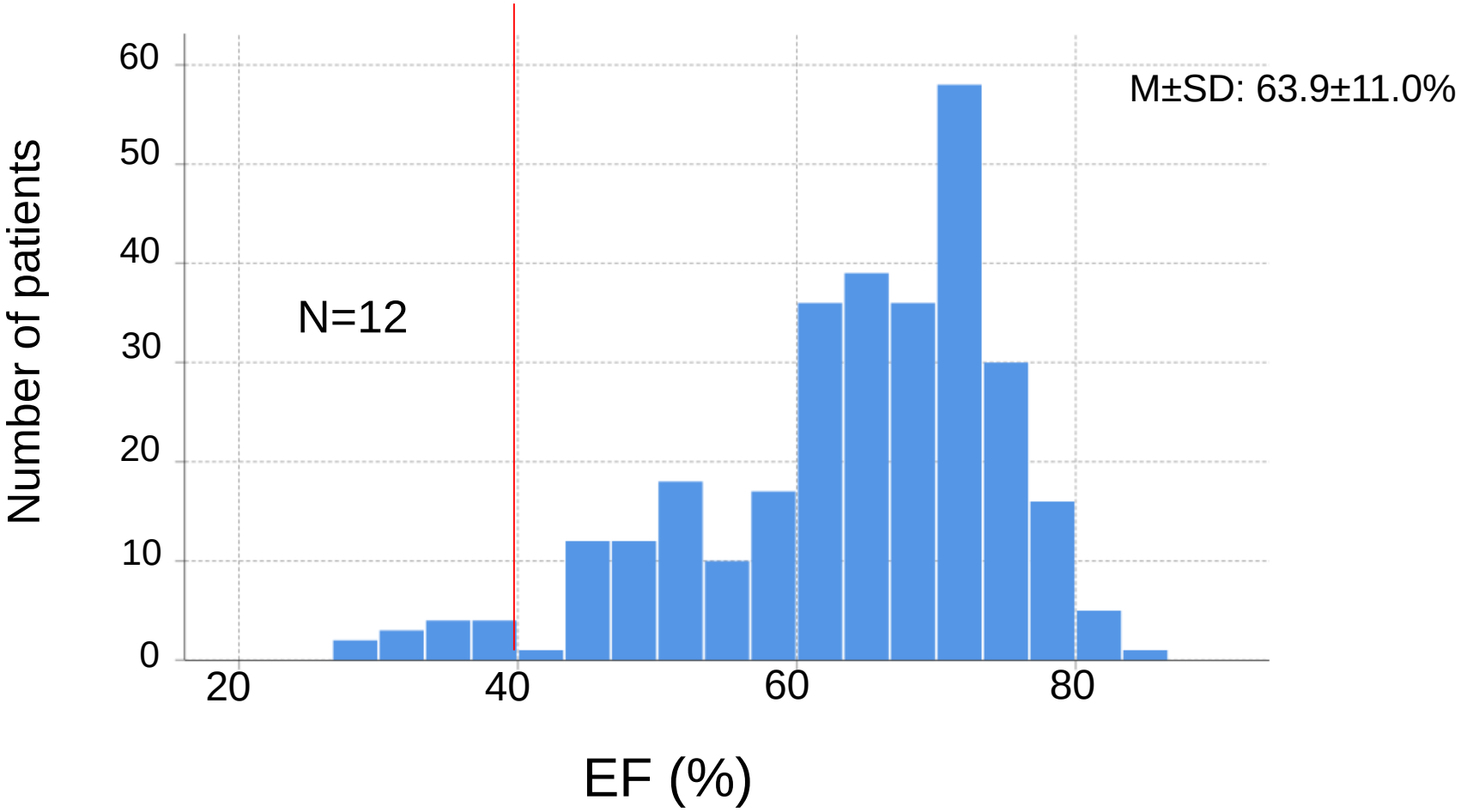
Sex	
Female/Male	94/210
Age (M±SD)	31~90 (70±12)
DM (%)	192 (59.8%)
HT (%)	290 (95.4%)
AVF	
Radial artery – Cephalic vein	273 (89.8%)
Ulnar artery – Basilic vein	18 (5.9%)
Radial artery – Basilic vein	5 (1.6%)
Radial artery – Brachial vein	3 (1.0%)
Brachial artery– Communicating vein	2 (0.7%)
Others	3 (1.0%)

Arteriovenous fistula: AVF, Mean ± standard deviation: M±SD

Patient Survival



Histogram of EF



Predictors of all-cause mortality by Cox proportional hazards analysis

	Hazard ratio	CI		ChiSq	P
Age, (above 71 years)	1.44	1.21	1.74	16.3	0.0001
Female sex	0.91	0.74	1.10	0.98	0.3
Diabetes	1.11	0.92	1.33	1.22	0.26
Hypertension	1.01	0.71	1.57	0.005	0.94
EF	0.99	0.97	1.00	3.51	0.06

Predictors of all-cause mortality by Cox proportional hazards analysis

[EF lower than 40%]

	Hazard ratio	CI		ChiSq	P
Age, (above 71 years)	1.44	1.21	1.74	16.30	0.0001
Female sex	0.90	0.74	1.10	1.20	0.27
Diabetes	1.10	0.92	1.32	1.02	0.31
Hypertension	0.99	0.69	1.54	0.002	0.96
EF (<40%)	1.13	0.73	1.61	0.35	0.56

RESULTS

1) Three hundred and four patients were included in this study. The average age at HD was 70 years.

2) Survival rate was 94% at 1 year.

3) The average EF value was 64%.

4) After adjustments using Cox regression analysis for calculating hazard ratios, the EF values were not associated with an increased risk of all-cause mortality [Hazard ratio 0.99, 95% CI (0.97-1.00), P=0.06].

5) Even if the EF values were lower than 40%, they were not significantly associated with an increased risk of all-cause mortality [Hazard ratio 1.13, 95% CI (0.73-1.61), P=0.56].

CONCLUSION

EF values prior to hemodialysis initiation may not be predictive of all-cause mortality in incident hemodialysis patients.