

Long-Term Impact of Multiple Comorbid Risk Factors on Survival After Left Ventricular Assist Device Implantation



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BACKGROUND

The survival benefit of LVAD support in advanced heart failure (HF) is well established. Patients with HF often have multiple comorbid conditions which may impact long-term survival after LVAD implantation.

RESEARCH AIM

We evaluated the association of risk factor burden and survival in LVAD patients with long-term follow-up.

METHODS: Overview

•We studied 132 patients implanted with an axial continuous-flow LVAD at the University of Rochester, NY between 2008-2014 and who survived > 6 months.

•Patients were supported by a LVAD for a mean of 3.5 ± 1.7 years (range 0.6-8.0 years) after LVAD implantation.

•The University of Rochester LVAD Database, created using medical record and INTERMACS data, was used for this study.

•Weighted log-rank tests were used to identify preoperative risk factors associated with mortality. Renal dysfunction was defined as glomerular filtration rate <60 mL/min/1.73m².

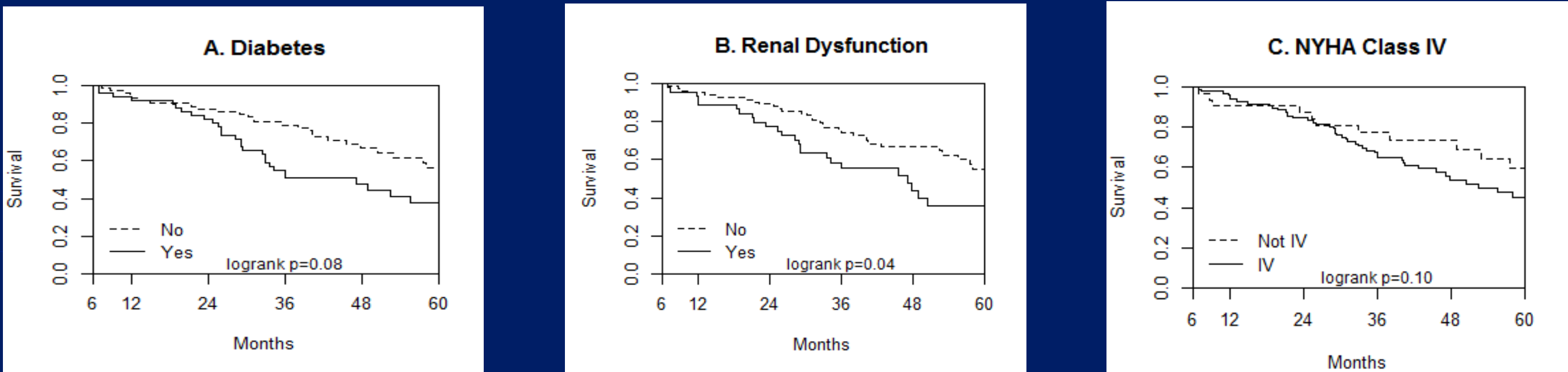
•Chi-square test and Wald test were used to study preoperative characteristics of patients with varying risk factor burden.

•A Cox proportional hazards (PH) model was used to compare mortality among patients with varying risk factor burden.

RESULTS: Risk Factors for Mortality During Long-Term Follow-up

• In univariate analyses, diabetes (p=0.08), renal dysfunction (p=0.04), and NYHA Class IV (p=0.10) were identified as the most predictive risk factors in this set.

Risk Factors and Long-Term Survival

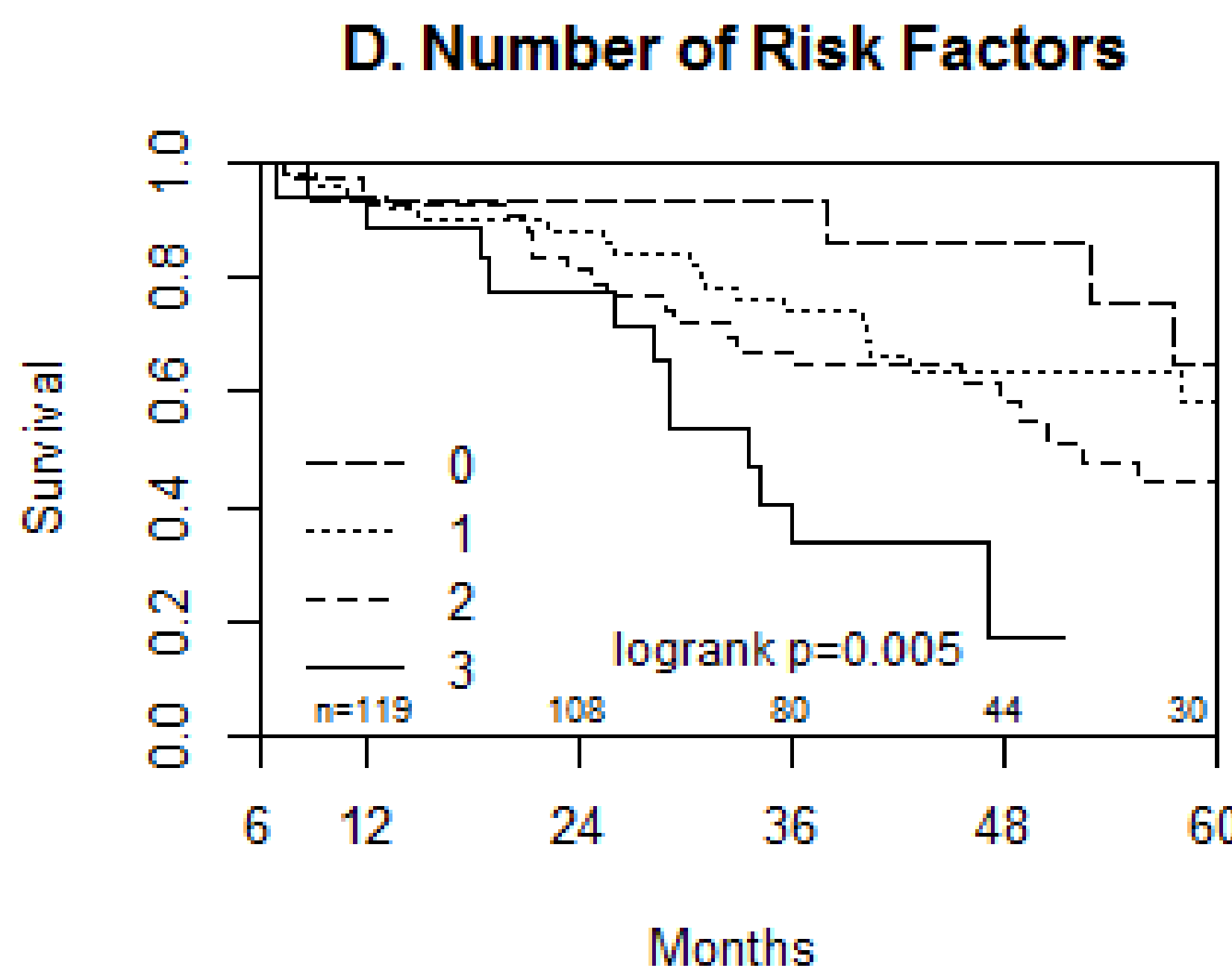


RESULTS: Risk Factor Burden and Survival

•Using a Cox PH regression model, there was an increasing risk of death with increasing risk factor burden and this elevated risk persisted even after 5 years of follow-up (p for the overall difference=0.005)

•Four years after LVAD implant, patients with 0 risk factors had a 0.87 (95% CI: 0.71-1.00) probability of survival, and patients with 3 risk factors had a 0.17 (95% CI: 0.04-0.79) probability of survival.

Risk Factor Burden and Survival



CONCLUSIONS

•In LVAD patients, renal dysfunction, diabetes, and NYHA Class IV at LVAD placement were risk factors associated with increased mortality.

•During long-term follow-up, survival was poor in patients with multiple risk factors.

RESULTS: Characteristics of Patients with Varying Risk Factor Burden

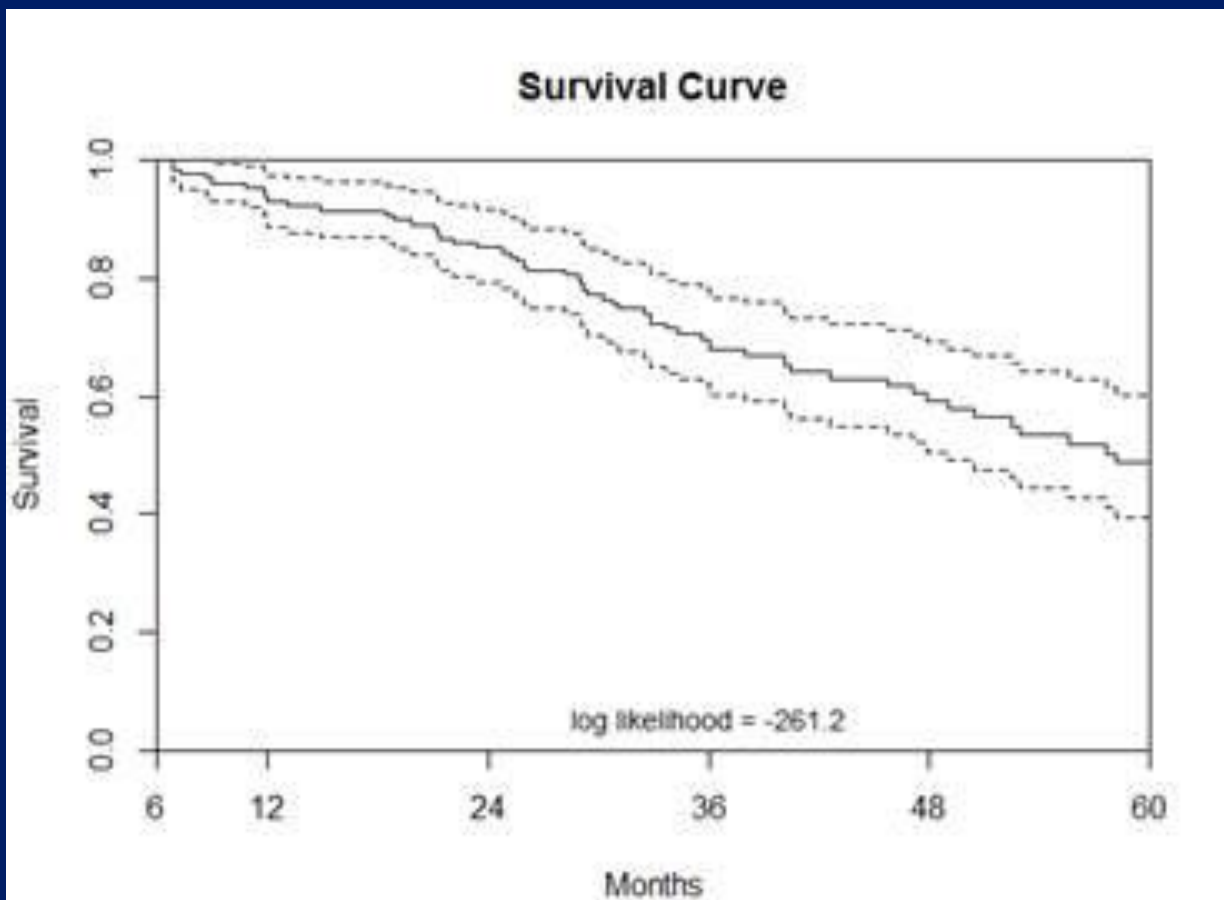
Preoperative Characteristics of Patients by Risk Factor Burden

Variable	All Patients N=132	Patients with Zero Risk Factors N=16	Patients with One Risk Factor N=52	Patients with Two Risk Factors N=46	Patients with Three Risk Factors N=18	P-value
Age (years)	56.5	56.3	54.6	57.4	60.3	0.129
Male	85%	94%	87%	83%	78%	0.575
Race- black	14%	13%	12%	17%	11%	0.859
Race- white	83%	88%	83%	80%	89%	0.805
Destination Therapy	37%	25%	31%	46%	44%	0.289
Ejection fraction (%)	18.2	14.4	18.4	17.8	21.6	0.051
INTERMACS 1 or 2	55%	38%	48%	70%	50%	0.059
Ischemic cause of heart failure	63%	50%	62%	61%	83%	0.225
Hypertension	55%	63%	46%	57%	67%	0.393
Atrial fibrillation	43%	56%	39%	44%	44%	0.663
Stroke	10%	13%	10%	7.0%	17%	0.686
Pulmonary vascular resistance > 3 Wood Units	42%	38%	42%	41%	44%	0.811
Implantable Cardioverter Defibrillator	75%	94%	67%	78%	72%	0.176
Smoking	12%	0%	14%	20%	0%	0.069

Distribution of Risk Factors in Different Groups

Variable	All Patients N=132	Patients with One Risk Factor N=52	Patients with Two Risk Factors N=46
Diabetes	39%	14%	57%
Renal dysfunction	36%	4.0%	59%
NYHA Class IV	76%	82%	85%

Survival of All Patients During Long-Term Follow-up*



*Dashed lines show 95% pointwise confidence limits.

During the entire follow-up period, 67 (50.8%) patients died, 13 (9.8%) underwent explant, 7 (5.3%) moved and were lost to follow-up, and 6 (4.5%) underwent transplant.