

Implication of Pre-operative Pulmonary Function Testing on Gastrointestinal Bleeding After Continuous Flow LVAD

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STUDY

Gastrointestinal bleeding (GIB) among patients supported with continuous-flow left ventricular assist devices (CF-LVAD) is common (20-40%), unpredictable and leads to increased morbidity and mortality. Previous investigation by our group identified chronic obstructive pulmonary disease (COPD) history as an independent risk factor for the development of GIB (HR= 1.89, 1.10-3.23 P<0.02). This study explores specific pulmonary function test (PFT) parameters associated with GIB.

METHODS

The present study includes subjects from single quaternary medical center with CF-LVAD between 2006 and 2014 (n=254) with PFT (n=200) prior (62±47 days) to LVAD implantation. The primary endpoint was GIB at 12 months, secondary outcome was 3-year all-cause mortality. Categorical variables were described using frequency and percentages. Continuous variables were described using mean and standard deviation. Competing Risks was used to describe cumulative incidence of GIB and Cox proportional hazards model was used to identify predictors associated with GIB and all-cause mortality.

RESULTS

The patient cohort (n=200) comprised of 75% males, 69% Caucasian, age 58±12.3 years, Intermacs designation 1-5 (1.5%, 28.5%, 20.5%, 33%, 5.5%, 11%- missing), 72% former cigarette smokers, 25% designated as COPD, BMI 30.3±7.2 kg/m², and 73% BTT indication. GIB occurred among 54/200 (27%) patients, with incidence rates at 1, 3 and 12 months of 12%, 21% and 27% (Table 1). Pre-operative PFT parameters including: FEV1 (0.88 [0.79-0.99]), DLCO (0.65 [0.47-0.9]), and DLCO% (0.88 [0.8-0.96]) demonstrated independent risk of 12 month GIB after CF-LVAD (Figure 1). Finally, presence of GIB within 12 months of implant was associated with increased risk of 3-year all-cause mortality (HR 2.86[1.65-4.94], p<0.01).

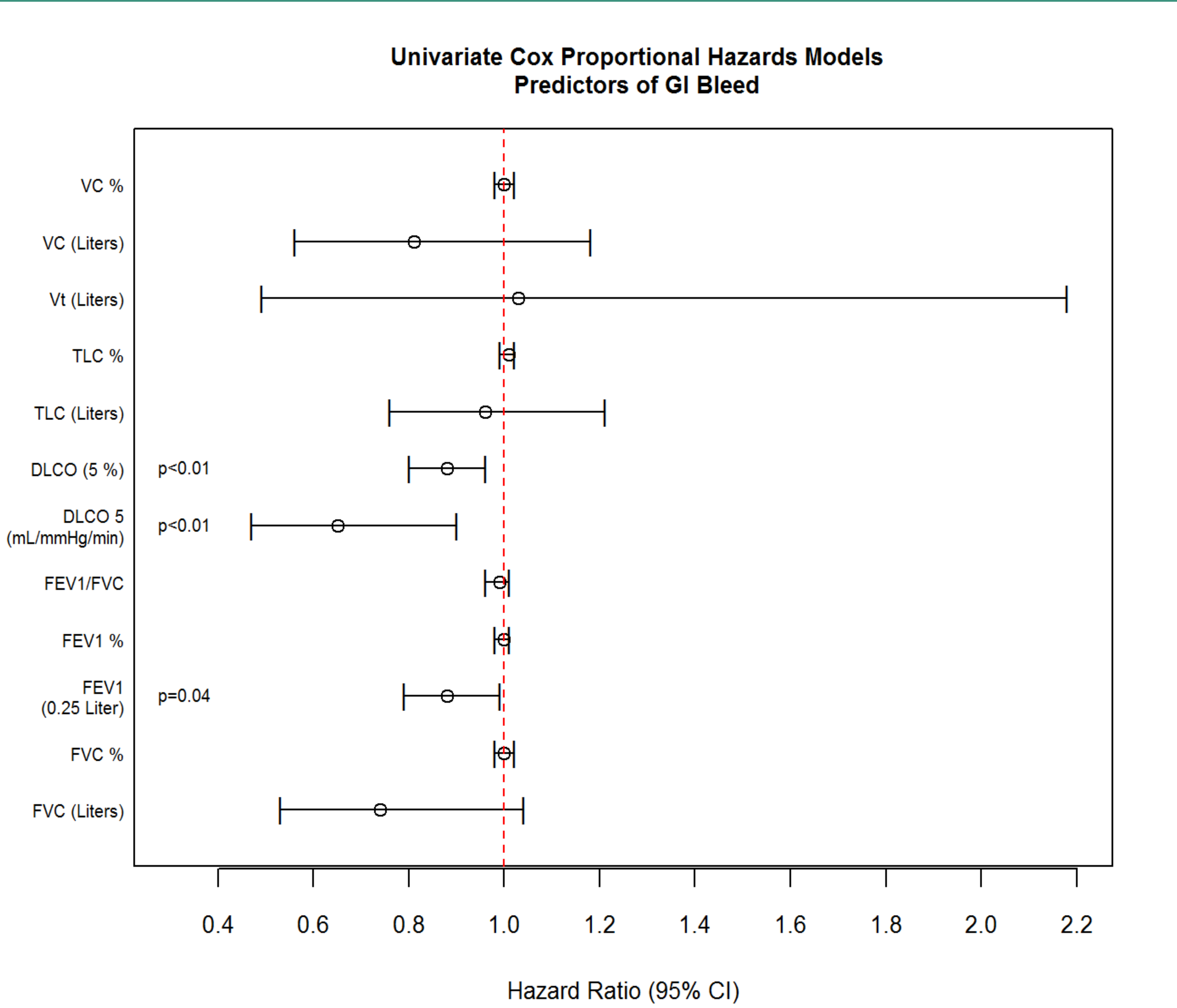


Figure 1: Identification of predictors of gastrointestinal bleeding using Cox Proportional Hazards Model

Demographics	Freq (%); Mean +/- STD	Comorbidities	Freq (%); Mean +/- STD	Hemodynamics	Freq (%); Mean +/- STD	Pulmonary Function	Freq (%); Mean +/- STD
Age at Implant	58.2 +/- 12.3	Smoking Status		Heart Rate	83.7 +/- 16.2	FVC (Liters)	3 +/- 0.8
Male	150 (75%)	Current Smoker	4 (2%)	Diastolic Pressure	65.4 +/- 10.7	FVC %	73.9 +/- 14.7
Race		Former Smoker	144 (72%)	Systolic Pressure	103.9 +/- 19.4	FEV1 (Liters)	2.1 +/- 0.6
Caucasian	138 (69%)	Never Smoker	52 (26%)	RA Pressure	12.9 +/- 5.6	FEV1 %	68.4 +/- 15.4
African-American	54 (27%)	Comorbidities		PA Systolic	56 +/- 17.8	FEV1/FVC	71 +/- 9.4
Other	8 (4%)	A-Fib	108 (54%)	PA Diastolic	27.7 +/- 8.2	DLCO (mL/mmHg/min)	13.8 +/- 4.8
Intermacs		Prior GI Eval	111 (55.5%)	PCWP	23.6 +/- 8.6	DLCO %	59.1 +/- 17.1
1	3 (1.5%)	Pre-LVAD BUN	34.4 +/- 21.1	Cardiac Index (Fick)	1.9 +/- 0.5	TLC (Liters)	5.1 +/- 1.2
2	57 (28.5%)	Pre-LVAD Creatinine	1.9 +/- 1.7	PVR	4.1 +/- 3	TLC %	85.2 +/- 15.4
3	41 (20.5%)	Pre-LVAD HGB	11.3 +/- 2.1			Vt (Liters)	0.9 +/- 0.4
4	66 (33.0%)	Pre-LVAD NA	136.5 +/- 4.1			VC (Liters)	3.2 +/- 0.8
5	11 (5.5%)	Cancer	39 (19.5%)			VC %	77.3 +/- 14.4
Missing/Not Done	22 (11.0%)	COPD	50 (25%)				
Indication		IHD	120 (60%)				
BTT	146 (73.0%)	Prior CABG	67 (33.5%)				
DT	54 (27.0%)	Prev MI	95 (47.5%)				
BMI (kg/m^2)	30.3 +/- 7.2	Prior PCI	101 (51%)				

Table 1: Patient cohort (n=200) baseline demographics, comorbidities, pulmonary function and hemodynamics described using continuous and categorical variables.

CONCLUSION

A 0.25 L reduction of FEV1, 5 mL decrease in DLCO or a 5% decrease in %DLCO by preoperative PFT testing is associated with a 12%, 35%, or 12% respective increase in 1 year GIB. GIB in the first year of CF-LVAD implant is associated with increase 3 year mortality (HR 2.86). We advocate prospective evaluation of patients with PFT prior to LVAD implantation to help ascribe GIB risk.

DISCLOSURES

Authors of this abstract have no relevant financial relationships to disclose.

