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THE IMPACT OF LOW BLOOD PRESSURE IN HEART FAILURE OUTCOME - RESULTS FROM THE REFERENCE STUDY

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BACKGROUND: It urges to define short-term risk stratification given that in heart failure (HF) patients mortality is highest during the first 90 days post-discharge. Low blood pressure plays a role in HF outcome as it is indicative of lack of tissue perfusion and more severe disease. Decreased systolic blood pressure (SBP) and diastolic blood pressure (DBP) values correlate with impaired survival.

OBJECTIVE: We studied the association of SBP <100 mmHg and DBP <60 mmHg at admission with early (defined as the period of 90 days post-discharge) all-cause mortality and long-term all-cause mortality in HF patients.

METHODS: At admission SBP <100 mmHg and DBP <60 mmHg were evaluated in patients hospitalized, to an Internal Medicine ward, with acute decompensated HF in class III or IV of NYHA. Subgroup analysis was performed according to the left ventricular ejection fraction (LVEF) in light of the current European Society of Cardiology guidelines. Descriptive analysis was performed using t test or Wilcoxon Rank test as applicable. Categorical variables were compared using chi-squared test or Fisher's Exact test as applicable. Univariate Cox proportional hazard model was used to assess the relationship between variables and outcomes.

RESULTS

90-DAY POST-DISCHARGE

N=65 HF patients
Mean age: 79.2 (SD 10.8)

Median follow-up : 13.7 months
[Q1: 6.7 to Q3: 18.9]

Table 1 – General baseline characteristics

Characteristics	Patients (n=65)
Age, mean (SD)	79.2 ± 10.8
Female Gender, n (%)	37 (56.9)
Hypertension, n (%)	58 (89.2)
Type 2 Diabetes, n (%)	25 (38.5)
Dyslipidemia, n (%)	41 (63.1)
Obesity, n (%)	17 (26.2)
Atrial Fibrillation, n (%)	28 (43.1)
Family History of CVD, n (%)	31 (47.7)
Tabagism, n (%)	21 (32.3)
Chronic Kidney Disease, n (%)	34 (52.3)
GFR (Baseline), median	57.8 (43.8 - 82.2)
GFR (Admission), median	47.9 (33.2 - 68.1)
Previous Acute Myocardial Infarction, n (%)	27 (41.5)
Hypertensive Cardiomyopathy, n (%)	44 (67.7)
Ischemic Cardiomyopathy, n (%)	22 (33.8)
Valvular Cardiomyopathy, n (%)	56 (86.2)
LVEF, mean (SD)	50.38 ± 19.07
Tricuspid Annulus Plane Systolic excursion (TAPSE), mean (SD)	17.7 ± 4.0
Pulmonary Artery Systolic Pressure (PSAP), median	34.60 (25.94 - 50.05)
Systolic Blood Pressure (Admission), median	145.0 (121 - 163)
Diastolic Blood Pressure (Admission), median	77.0 (65 - 89)
NYHA class III, n (%)	43 (66.2)
ACE Inhibitor, n (%)	43 (66.2)
Beta Blocker, n (%)	38 (58.5)
Mineralocorticoid Receptor Antagonists, n (%)	19 (29.2)
Angiotensin II Receptor Blocker, n (%)	11 (16.9)
Loop Diuretic, n (%)	54 (83.1)
Digoxin, n (%)	8 (12.3)

Values are median (IQR), n (%), or mean±SD.
IQR: interquartile range and minimum/maximum, SD: standard deviation, CVD: cardiovascular disease, GFR: glomerular filtration rate.

- In general population study, the hazard of short-term mortality for patients with admission SBP <100 mmHg was 5.3 times higher than that for patients with admission SBP ≥100 mmHg (HR=5.330, 95% CI: 1.407-20.193, P-value=0.014), as depicted in Figure 1.
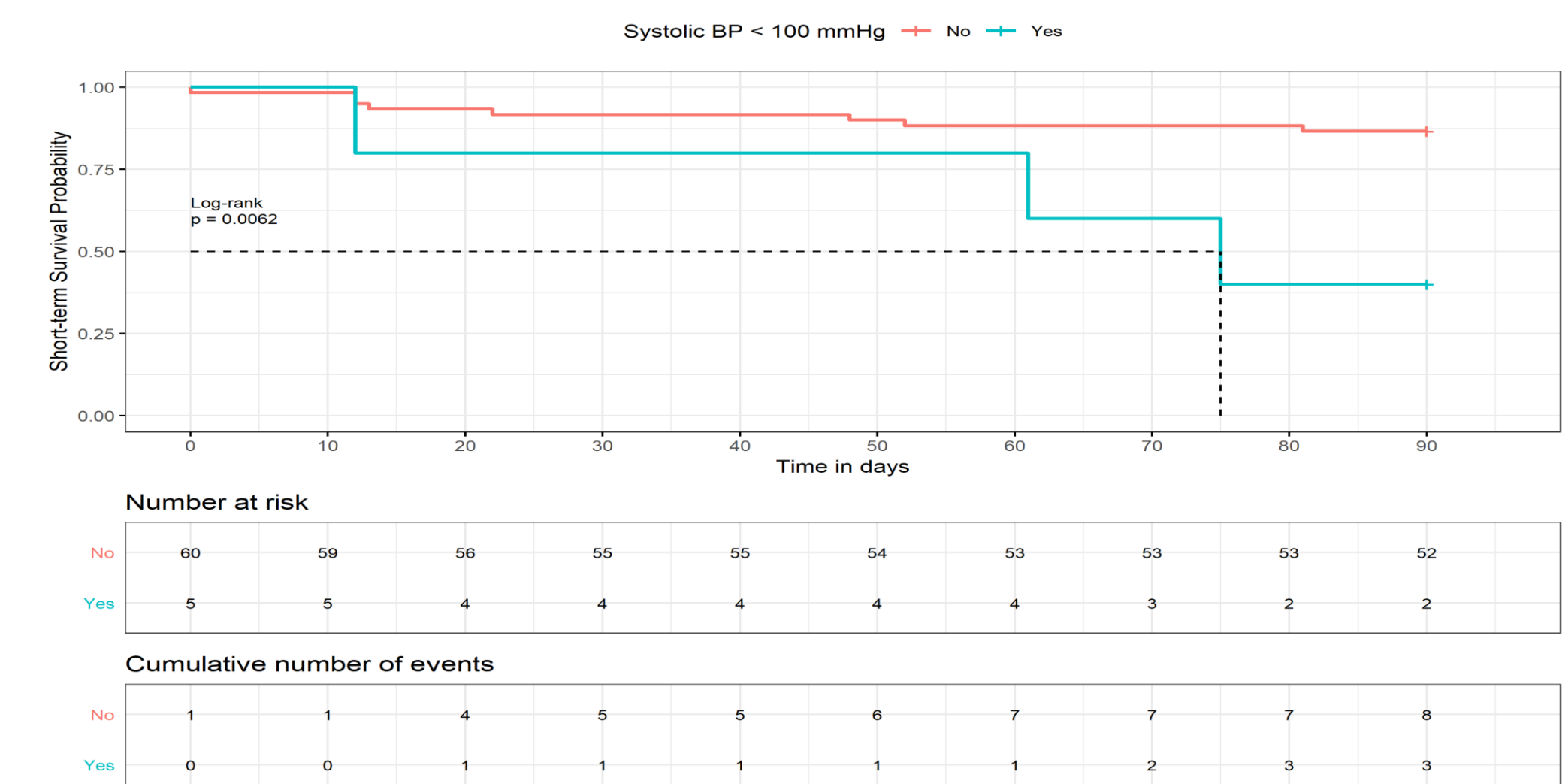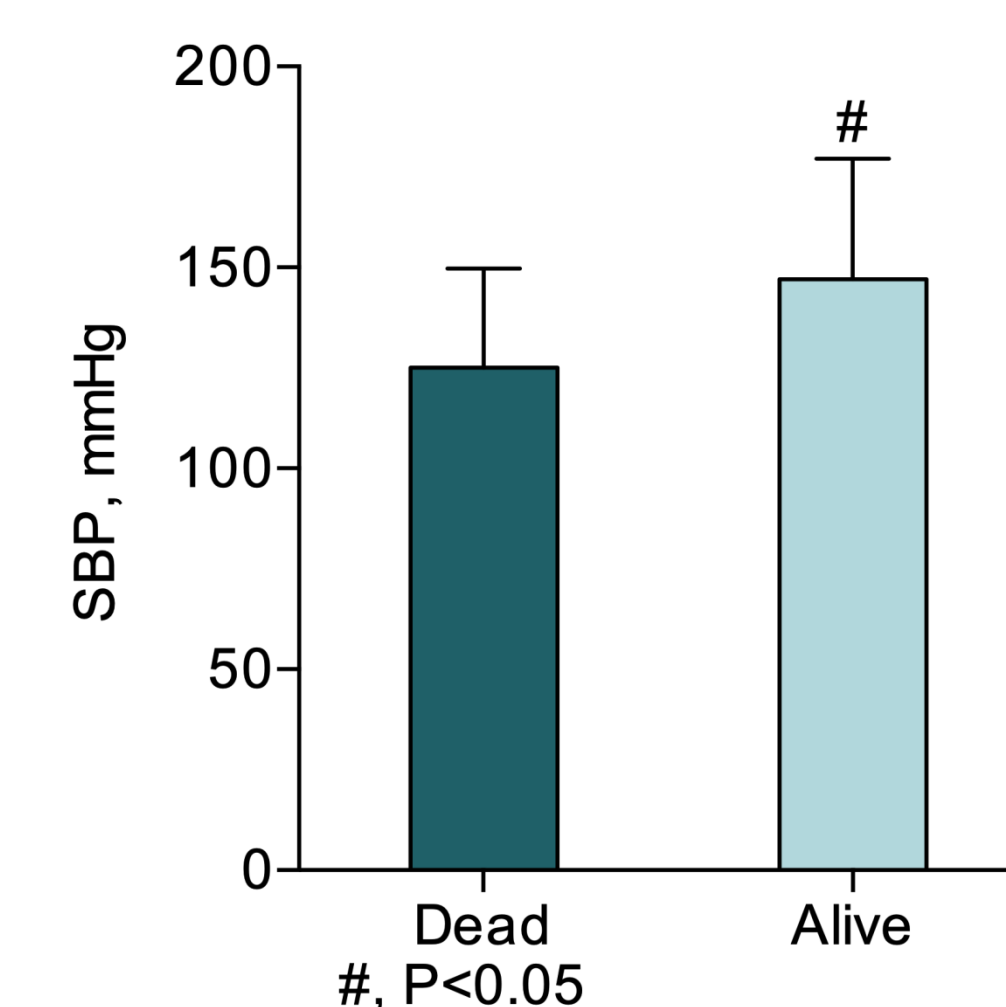

Figure 1. Short-term mortality - Kaplan Meier: Systolic blood pressure <100 mmHg

- As shown in Figure 2, the mean systolic blood pressure was significantly lower in the long-term mortality group than in the patients who survived.

- Comparatively to short-term mortality, for the referred value of admission SBP (i.e. <100 mmHg) the risk of long-term mortality, declined to 3.6 times (HR: 3.629, 95% CI: 1.239-10.631, P-value=0.019).
- Subgroup discrimination evidenced that long-term mortality hazard rose up to 6.3 times in the Heart Failure with Reduced Ejection Fraction (HFrEF) subgroup (HR: 6.303, 95% CI: 1.224-32.452, P-value=0.028).
- Regarding diastolic blood pressure, Figure 3 shows that the mean diastolic blood pressure was significantly lower in the patients who died precociously compared to those who survived the early post-discharge period.
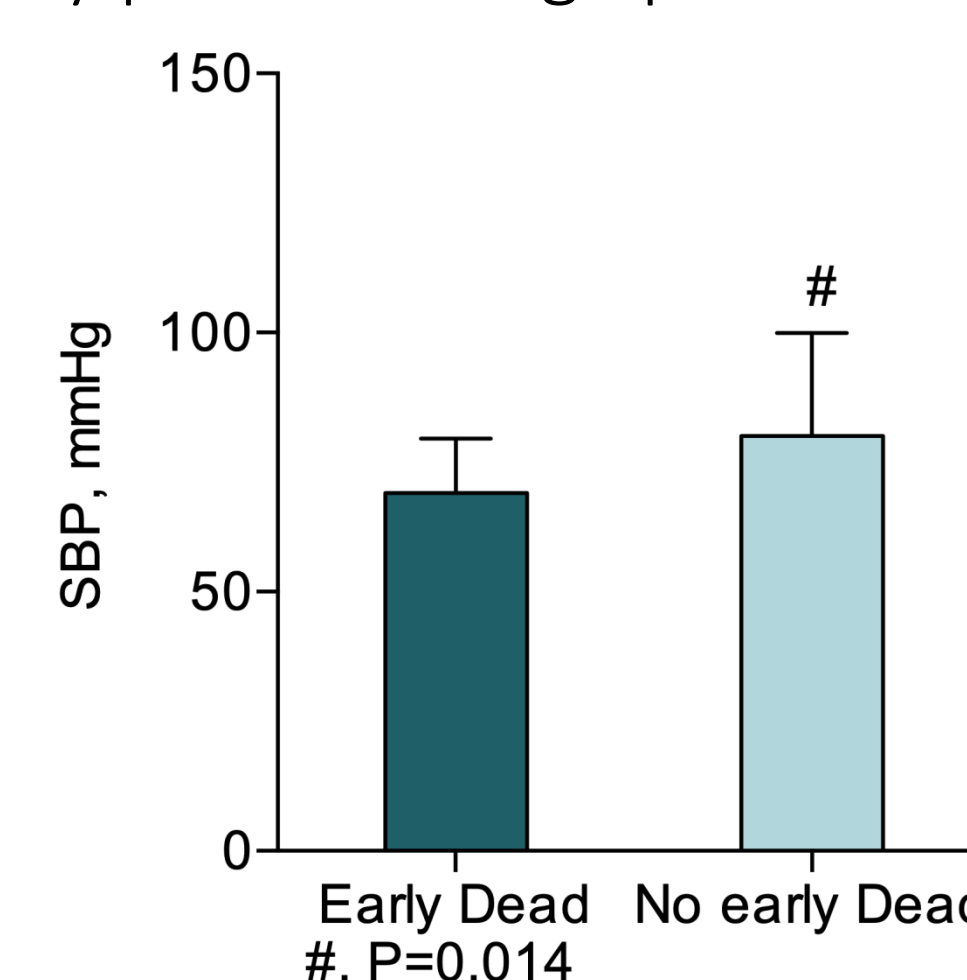
CONCLUSION:

- The patients with admission SBP <100 mmHg or DBP <60 mmHg evolved with substantial increased risk of short and long-term mortality.
- Interestingly, the hazard declined along follow-up which consubstantiates the assumption that the first 90 days post-discharge are critical in HF management.