



# Safety of Amlodipine Compared to Nifedipine Extended-Release (ER) (Dihydropyridine Calcium Channel Blockers) in Heart Failure (SAND-HF)



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## Background

- Dihydropyridine calcium channel blockers (DHP CCB) are often utilized in heart failure (HF) patients for treatment of hypertension once guideline-directed medical therapy (GDMT) is maximized.
- Packer et al. demonstrated the safety of amlodipine in HF patients finding no increased risk of death or HF hospitalizations.
- In contrast, nifedipine immediate-release (IR) is associated with worsening HF and increased hospitalizations according to a small crossover study in 1990.
- The safety of nifedipine extended-release (ER) has not been adequately studied in patients with HF on current GDMT.

## Objective

- To compare the effect of nifedipine ER to amlodipine in patients with HF and a prior HF hospitalization on HF hospitalizations and all-cause mortality

## Methods

### Primary endpoint\*:

- Composite rate of any HF hospitalization and all-cause mortality

### Secondary endpoints\*:

- Rate of HF-related hospitalizations
- Rate of all-cause mortality
- Rate of all-cause hospitalizations
- Composite rate of HF, acute coronary syndrome (ACS), and stroke hospitalizations
- Composite rate of any HF hospitalization and all-cause mortality in patients with HFrEF<sup>1</sup>

\*Endpoints reported as per 100 patient years

## Disclosures

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation

## Methods

- Retrospective, observational, single center, multi-site cohort study

### Inclusion criteria:

- Patients ≥ 18 years of age
- HFrEF<sup>1</sup> or HFpEF<sup>2</sup> with prior HF hospitalization
- Outpatient prescription for amlodipine or nifedipine ER from 4/19/09 - 4/19/16

### Exclusion criteria:

- Any mechanical circulatory support or prior heart transplant
- Chronic hemodialysis
- Outpatient inotrope therapy
- Prescription for nifedipine IR
- Medication compliance < 80%

## Results

Characteristic	Amlodipine (N=186)	Nifedipine (N=58)	P-value
Total duration on treatment (years)	296.9	50.5	--
Median duration (years) of treatment per patient (Interquartile range)	0.9 (0.3-2.2)	0.5 (0.2 - 1.0)	<0.001
Age (years), mean	68	67	0.58
Male sex –no. (%)	184 (98.9)	56 (96.6)	0.24
Race –no. (%)			
White	136 (73.1)	32 (55.2)	0.05
African American	40 (21.5)	21 (36.2)	0.02
Other	10 (5.4)	2 (3.5)	1.00
EF (%), mean	44.98	52.6	0.001
EF Category –no. (%)			
EF >50%	61 (32.8)	36 (62)	<0.001
EF 41-50%	46 (24.7)	9 (15.5)	0.15
EF ≤ 40%	67 (36)	10 (17.3)	<0.001
eGFR, mean	57.9	48.9	0.033
eGFR, median (Interquartile range)	57.8 (35.5 - 77.8)	53.6 (28.5-66.3)	0.033
Diabetes (A1c >6.5%) –no. (%)	107 (57.5)	34 (58.6)	1.00
Concomitant medications –no. (%)			
Any beta blocker	72 (38.7)	45 (77.6)	0.001
Beta blocker with evidence in HF	48 (25.8)	24 (41.4)	0.032
ACEi <sup>3</sup> or ARB <sup>4</sup>	127 (68.3)	37 (64.0)	0.53
MRA <sup>5</sup>	26 (14.0)	11 (19.0)	0.40
Hydralazine/nitrate	0	0	----
Digoxin	22 (11.8)	3 (5.2)	0.21

<sup>1</sup>HFrEF: Heart failure with reduced ejection fraction

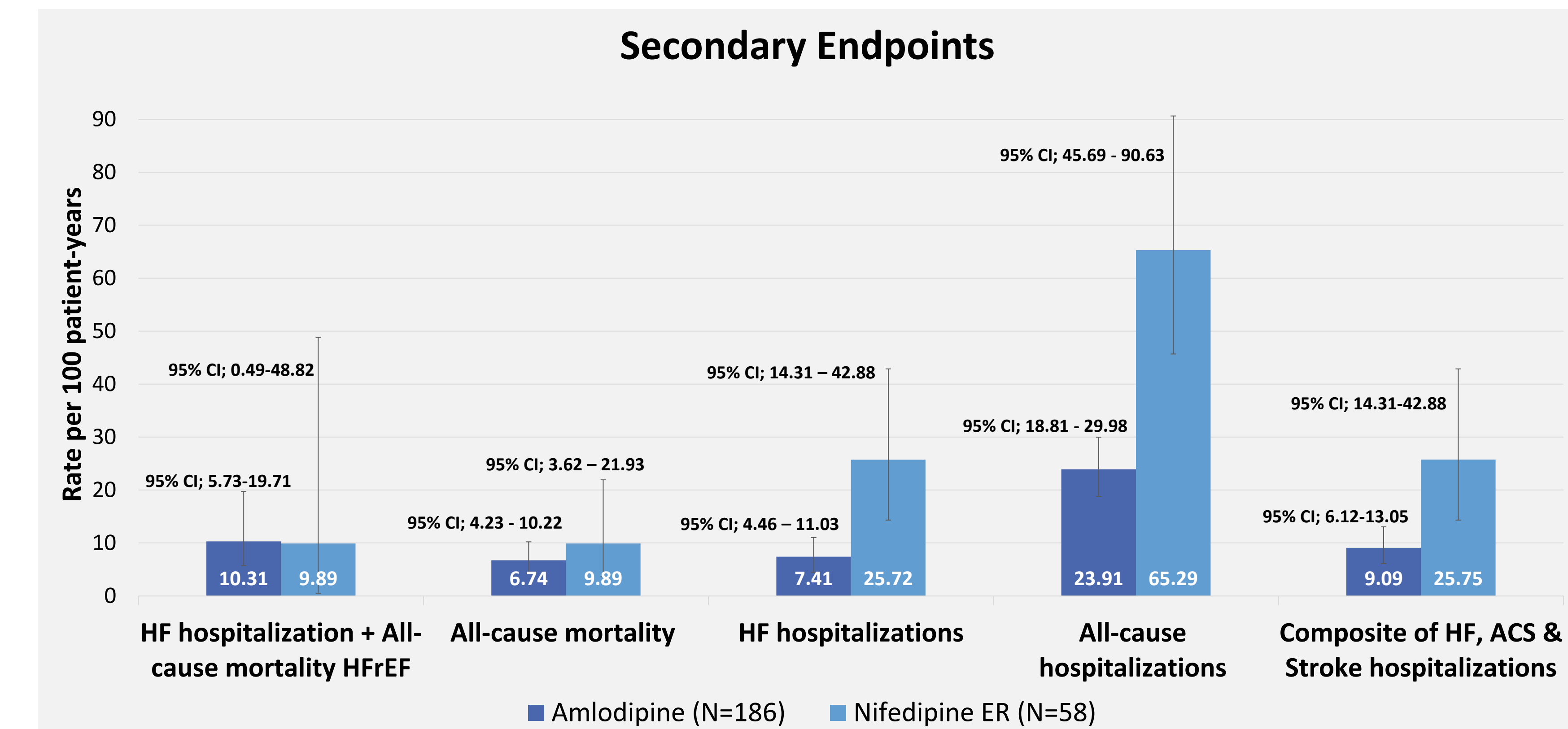
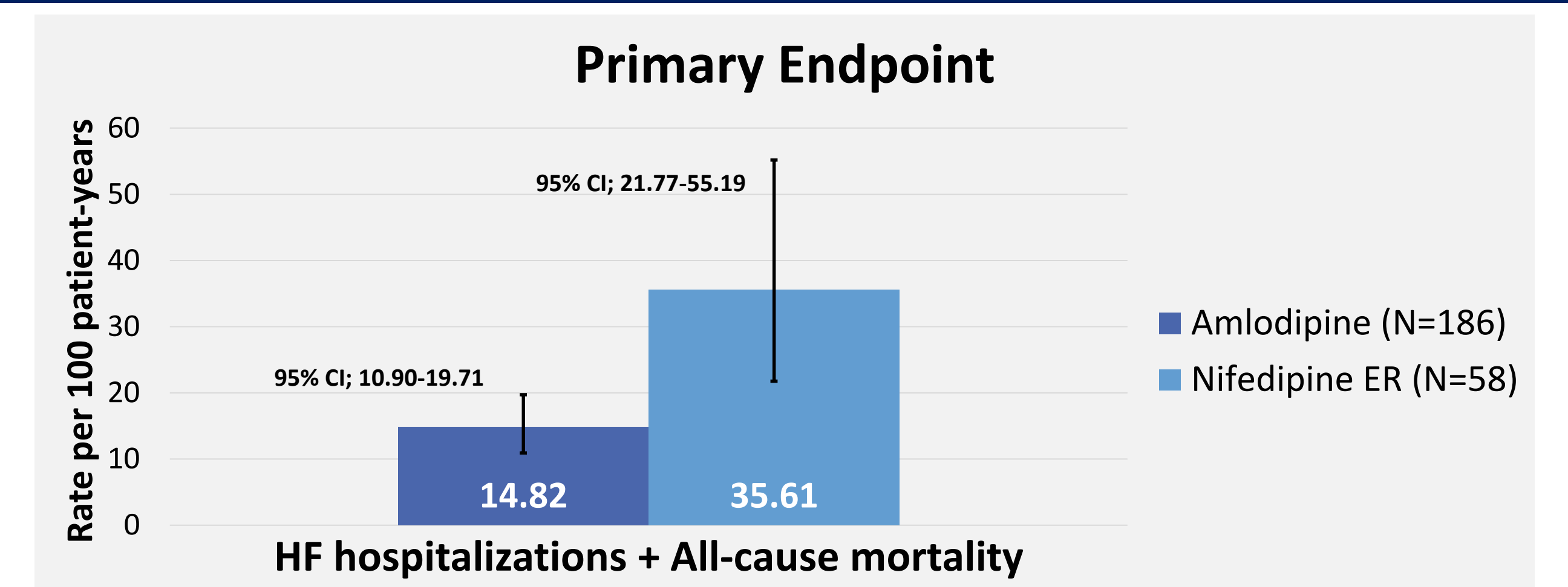
<sup>2</sup>HFpEF: Heart failure with preserved ejection fraction

<sup>3</sup>ACEi: angiotensin converting enzyme inhibitor

<sup>4</sup>ARB: angiotensin II receptor blockers

<sup>5</sup>MRA: Mineralocorticoid receptor antagonist

## Results



## Conclusion

- Compared to amlodipine, use of nifedipine ER in HF patients may increase the rate of the composite endpoint of HF hospitalizations and all-cause mortality.
- Additionally, the use of nifedipine ER may be associated with higher rates of hospitalizations, both all-cause and HF-related, as well as the composite of HF, ACS & stroke hospitalizations.
- Due to the small nifedipine sample size and inherent limitations in this study, further research is needed.

## References

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