

# Impact of aldosterone receptor antagonists versus chronic daily potassium supplementation on rates of readmission in patients with HFrEF

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## Purpose

- To determine if HFrEF patients taking aldosterone receptor antagonists (ARAs) have reduced readmission rates and mortality compared to patients taking only chronic daily potassium supplements

## Background

- ARAs have shown in previous studies to have a morbidity and mortality benefits in heart failure patients with reduced ejection fraction (HFrEF)
- Conflicting data exists regarding symptoms and short-term readmissions.
- Despite clinical outcome benefits seen with ARAs in clinical trials, there is under-utilization in HFrEF patients
- Chronic daily potassium is commonly used for hypokalemia in HFrEF

## Study Design

Retrospective cohort study by chart review

### Population:

#### Inclusion Criteria

- Age  $\geq 18$
- Admitted to the Heart Failure Clinic from 2015 and 2017 with at least one visit
- Diagnosis of Heart Failure with Reduced Ejection Fraction (HFrEF)
- New York Heart Association (NYHA) class II, III or IV
- On ARA or chronic daily potassium supplementation

#### Exclusion Criteria

- Serum creatinine  $\geq 2.5$  mg per deciliter
- Serum potassium  $\geq 5.0$  mmol per liter
- Comorbidities including congenital heart disease, active cancer, heart transplant or waiting for a heart transplant
- Pregnancy
- Ejection Fraction  $>40\%$

#### Sample Size

- 876 total patients reviewed
- 191 patients included in study
- 343 patients excluded for not visiting the HF clinic at least once
- 145 patients excluded for an EF  $>40\%$
- 106 patients excluded due to not being on an ARA or chronic daily potassium
- 17 patients excluded due to elevated serum creatinine
- 32 patients excluded due to elevated serum potassium
- 42 patients excluded due to active cancer

## Study Outcomes

### Primary outcome

- Composite of cardiac related hospitalizations and mortality

### Secondary outcomes

- All cause mortality
- All cause hospitalizations
- Occurrence of mild hyperkalemia (serum potassium 5.1-5.5 mmol/L)
- Occurrence of severe hyperkalemia (serum potassium  $>5.5$  mmol/L)
- Number of cardiac related hospitalizations stratified by HF clinic visits

## Results

- Statistical analysis is currently pending on the study results
- Baseline Characteristics
  - Age:  $65 \pm 16.1$  Male: 129 (67.5%)
  - EF:  $24.7 \pm 8.2$  Female: 62 (32.5%)
  - SCr:  $1.26 \pm 0.36$  White: 144 (75.3%)
  - CrCl:  $58.9 \pm 24.1$  Black: 26 (13.6%)
  - Potassium:  $4.1 \pm 0.4$  Hispanic: 21 (11.1%)

Table 1. Study Outcomes	Spironolactone	Potassium	Combination
Primary Outcome			
• Cardiac Hospitalizations	28 (0.46/person)	57 (0.7/person)	25 (0.48/person)
Secondary Outcomes			
• All Cause Mortality	3 (5.1%)	3 (3.8%)	3 (5.8%)
• All Cause Hospitalizations	107 (1.8%)	244 (3.1%)	167 (3.2%)
• Mild Hyperkalemia	3 (5.1%)	0 (0.0%)	1 (1.9%)
• Severe Hyperkalemia	0 (0.0%)	1 (1.3%)	1 (1.9%)

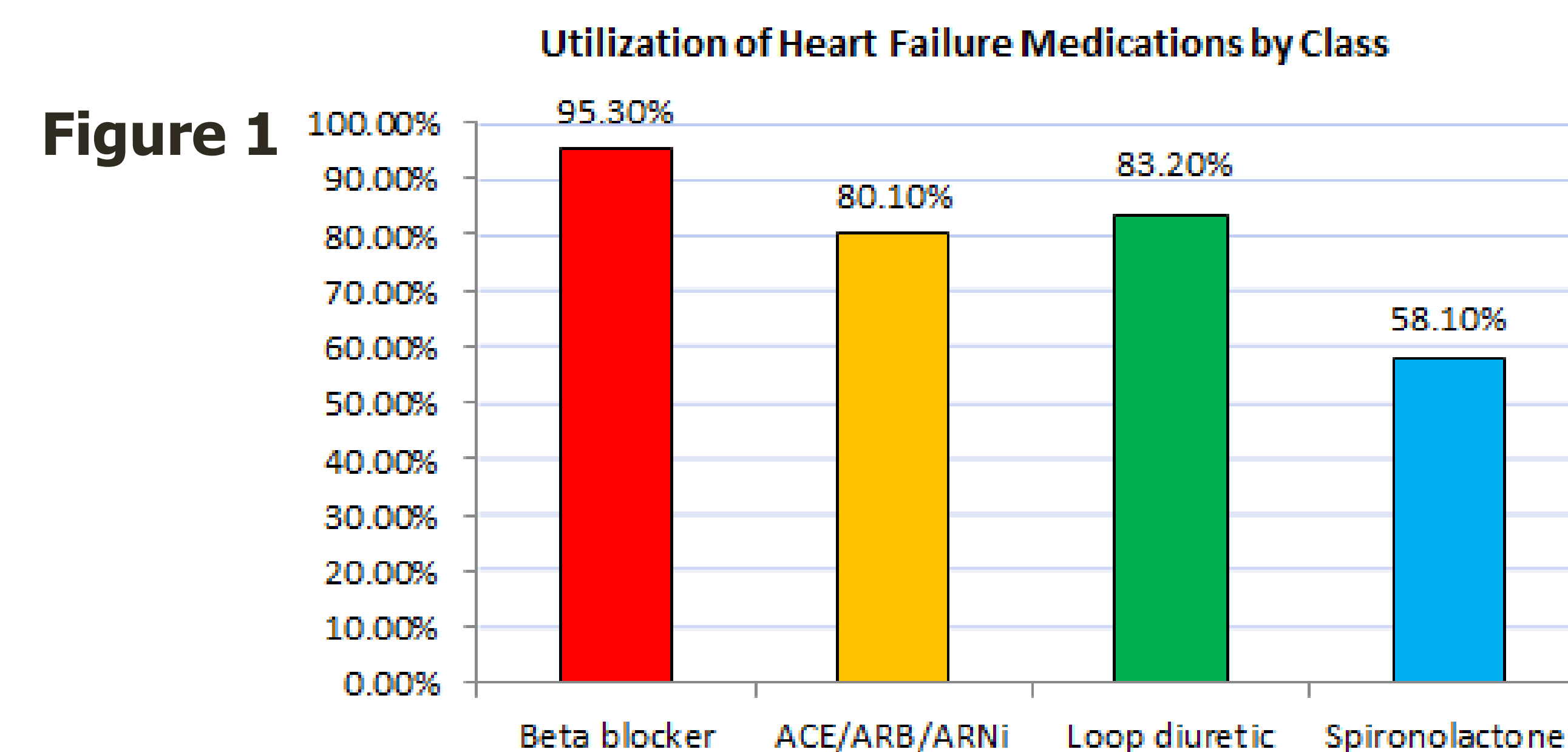
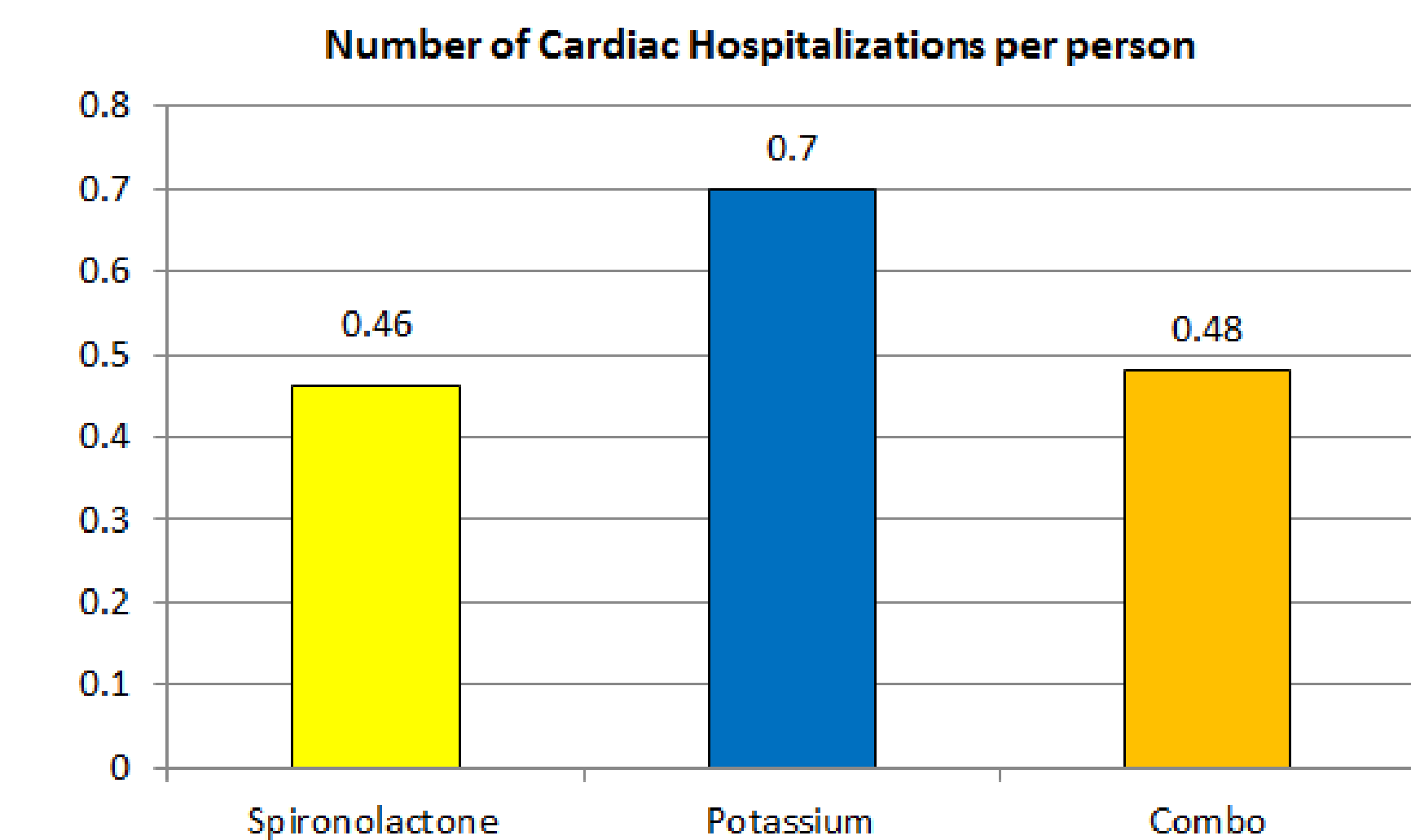


Table 2. Avg. Cardiac hospitalizations/ patient	1-2 visits	3-10 visits	11-18 visits	> 18 visits
Spironolactone group	3/12 (0.26)	6/23 (0.26)	14/14 (1.0)	4/10 (0.40)
Potassium group	2/7 (0.29)	23/27 (0.85)	7/18 (0.39)	24/28 (0.86)
Combination group	7/10 (0.70)	12/24 (0.50)	6/7 (0.86)	0/11 (0.0)

## Discussion

- Clinically significant trend towards reduced cardiac related readmissions among patients who are taking spironolactone alone or in combination with chronic daily potassium versus chronic daily potassium alone

Figure 2



- No clinical significance correlates the number of heart failure visits to the number of rehospitalizations in any groups thus the heart failure clinic did not influence the results
- Larger number of patients who had mild hyperkalemia in the spironolactone only group, but none experienced severe hyperkalemia
- Reduced all cause mortality and hospitalizations for patients taking spironolactone, but likely not clinically relevant
- Opportunity to optimize ARA usage in heart failure clinic to improve patient outcomes
- Study did not meet power and more research is needed for this subject
- Confounding factors include
  - Lack of complete documentation
  - Unknown patient adherence to medications
  - Etiology of heart failure varied among patients
  - High likelihood of patients lost to follow up may be deceased

## Conclusion

- Clinically significant reduction in cardiac hospitalizations in HFrEF patients on ARA therapy versus chronic daily potassium alone
- Despite known clinical outcome benefits with ARAs, opportunities exist for optimization of ARA therapy in HF clinic patients, particularly those with significant numbers of clinic visits

## Disclosure

- The authors of this study do not have any conflicts of interest

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