

INTRODUCTION

- Atrial fibrillation (AF) and heart failure (HF) are prominent causes of morbidity and mortality in the United States
- There is a lack of consensus over the preferred rate control method for patients with AF and HF¹⁻²
- No pharmacologic rate control strategy has shown superiority in reduction of mortality or HF hospitalizations

PURPOSE

To evaluate all-cause mortality and readmissions within 1 year in patients with AF and HF who received various rate control strategies during an inpatient admission

METHODS

Study Design

- Retrospective cohort study to assess for differences in outcomes between pharmacological rate control agents among hospitalized patients with AF and HF at a large academic medical center
- Approved by the Institutional Review Board at the University of Pittsburgh

Inclusion Criteria

- Hospitalized between January 1, 2019 and December 31, 2021
- Listed diagnoses of AF and HF via ICD-10 codes
- Charges for at least one of the following medications: a beta blocker, a non-dihydropyridine calcium channel blocker, digoxin, or intravenous amiodarone

Exclusion Criteria

- Patients who did not receive at least 1 rate control medication during the index hospitalization

Primary Endpoint

- All-cause mortality within one year

Secondary Endpoint

- All-cause rehospitalizations within one year

Statistical Analysis

- Performed using the Pearson chi-square test on IBM SPSS software version 28.0.1.1

RESULTS

Figure 1: Flow Diagram of Subject Inclusion and Exclusion

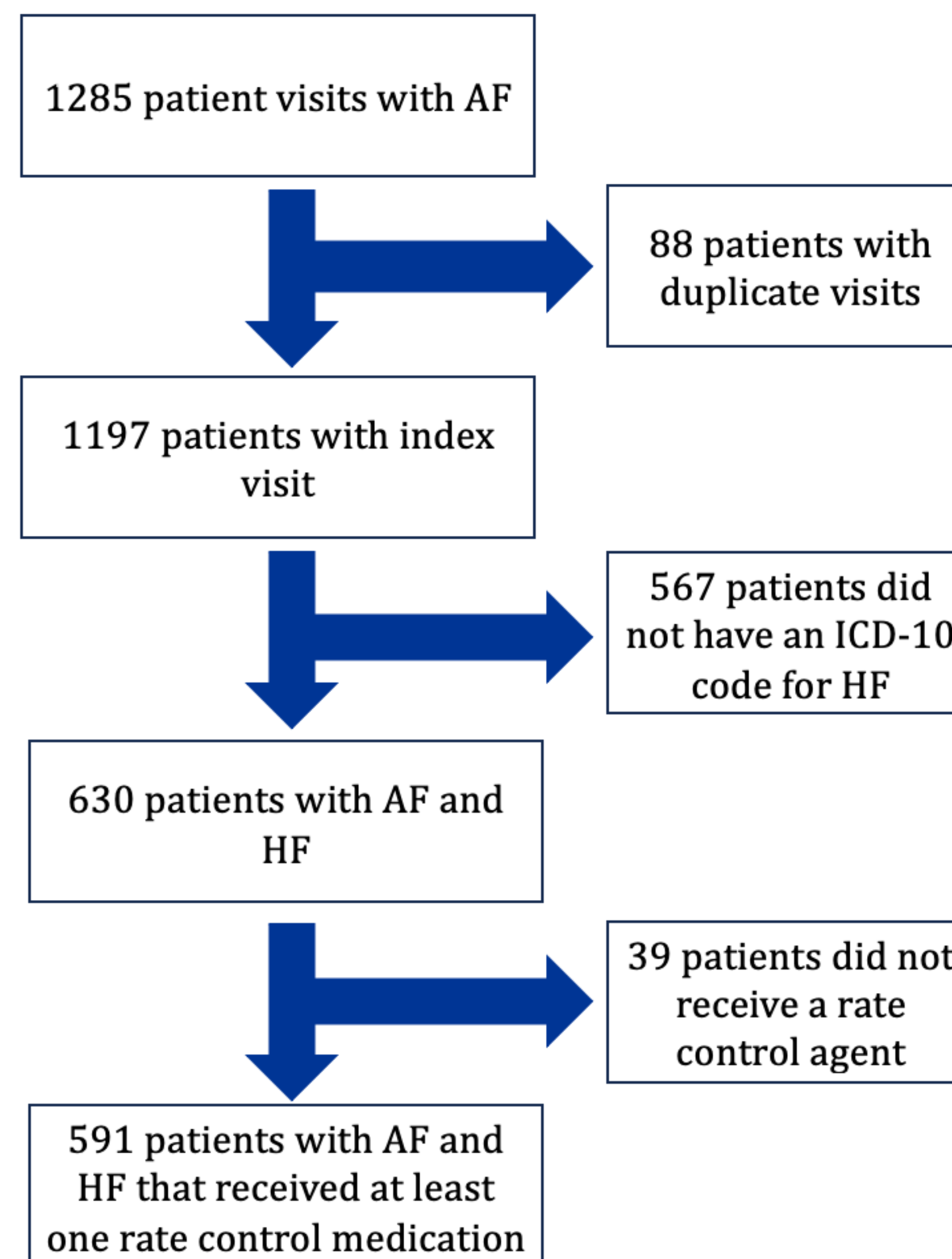


Table 1: Baseline Characteristics Among Patients Included in the Study (N=591)

Characteristic	Number of Patients
Hypertension	520 (88.0%)
Anticoagulant Use	461 (78.0%)
Diabetes	256 (43.3%)
COPD	169 (28.6%)
MI	118 (20.0%)
Inotrope Use	105 (17.8%)
Valvular Disease	93 (15.7%)
HFrEF	85 (14.4%)
Sepsis	66 (11.2%)
Asthma	23 (3.9%)
Stroke	5 (0.8%)
TIA	2 (0.3%)
Angina	2 (0.3%)

Table 2: Mortality and Readmissions Among 263 Patients Who Received One Rate Control Medication Class

	Mortality Within 1 Year of Index Visit	Patients With At Least 1 Rehospitalization
Beta Blocker (N=221)	25 (11.3%)	110 (51.2%)
Amiodarone (N=32)	16 (50%)	11 (57.9%)
Calcium Channel Blocker (N=7)	1 (14.3%)	3 (42.9%)
Digoxin (N=3)	2 (66.7%)	0

Table 3: Mortality and Readmissions Among 241 Patients Who Received Two Rate Control Medication Classes

	Mortality Within 1 Year of Index Visit	Patients With At Least 1 Rehospitalization
Beta Blocker + Amiodarone (N=130)	35 (26.9%)	45 (44.6%)
Beta Blocker + Calcium Channel Blocker (N=85)	5 (5.9%)	42 (49.4%)
Beta Blocker + Digoxin (N=21)	1 (4.8%)	8 (40%)
Dual Therapy Without a Beta Blocker (N=5)	1 (20%)	2 (40%)

RESULTS (Cont'd)

Baseline Characteristics

- 591 patients in total, including 263 who received one rate control medication class, 241 who received two classes, and 87 who received three or four classes
- Patients who received amiodarone monotherapy were more likely to have also received an inotrope ($p < 0.001$)

Primary Endpoint

- Mortality was significantly higher in patients who received amiodarone over those who received a beta blocker (50% vs. 11.3%, $p < 0.001$)
- Mortality was significantly higher in patients who received a beta blocker with amiodarone compared to a beta blocker with a calcium channel blocker (27% vs. 5.9%, $p < 0.001$)
- There was no association between mortality and the number of rate control classes used ($p = 0.280$)

Secondary Endpoint

- Among the 525 patients who survived the index visit, 258 (49.1%) were rehospitalized within one year
- No association was found between rate control medication utilization and rehospitalizations

LIMITATIONS

- Retrospective, single-center study
- Potential for miscoding because ICD-10 codes and medication charge codes were used to define baseline characteristics and medication utilization

CONCLUSIONS

- Monotherapy with amiodarone was associated with higher mortality compared to monotherapy with a beta blocker in patients with AF and HF
- Dual therapy with a beta blocker + amiodarone was associated with higher mortality compared to use of a beta blocker + calcium channel blocker
- Higher frequencies of inotrope use, sepsis, and STEMI in patients who received amiodarone may contribute to higher mortality
- Future prospective studies are needed to confirm these findings

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REFERENCES

- Gopinathannair R, Chen LY, Chung MK, et al. Managing atrial fibrillation in patients with heart failure and reduced ejection fraction: a scientific statement from the American Heart Association. *Circ Arrhythm Electrophysiol*. 2021;14(6):HAE000000000000078.
- Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation*. 2022;145(18):e895-e1032.