



Predictors of Electrical vs Pharmacologic Cardioversion in Critically Ill Patients With Atrial Fibrillation

Introduction

- Atrial fibrillation (AF) is common in critically ill patients and may worsen hemodynamic instability.
- Cardioversion is often required for rhythm control.
- Factors influencing the choice between electrical and pharmacologic cardioversion remain unclear.
- This study evaluated whether clinical variables, including age, acute coronary syndrome (ACS), acute respiratory failure (ARF), chronic heart failure (CHF), and hypertension (HTN), are associated with cardioversion strategy.

Methods

- A retrospective observational study was conducted using the Atrial Fibrillation in Critically Ill (AFICILL) dataset.
- Critically ill adult patients with pre-existing AF admitted to the ICU were included.
- The primary outcome was cardioversion strategy (electrical vs pharmacologic) during hospitalization.
- Predictor variables included age, ACS, ARF, CHF, and HTN.
- Multivariable logistic regression analysis was performed using Stata (BE 19) to estimate adjusted odds ratios (ORs) with 95% confidence intervals.

Results

- Among 1,705 critically ill patients with AF, 179 (10.5%) underwent electrical cardioversion and 290 (17.0%) received pharmacologic cardioversion. ARF was present in 397 patients (23.3%), ACS in 212 patients (12.4%), CHF in 693 patients (40.6%), and HTN in 838 patients (49.1%).

Variable	Pharmacologic OR (95% CI)	P	Electrical OR (95% CI)	P
ACS	1.52 (1.053–2.185)	0.025	0.13 (0.040–0.415)	0.001
ARF	1.23 (0.905–1.667)	0.186	0.02 (0.002–0.134)	<0.001
Age	0.99 (0.976–0.998)	0.025	0.93 (0.92–0.95)	<0.001
CHF	0.56 (0.423–0.754)	<0.001	0.30 (0.183–0.485)	<0.001
HTN	0.83 (0.643–1.083)	0.173	1.69 (1.181–2.42)	0.004

Table 1. Multivariable predictors of cardioversion strategy (OR, 95% CI).

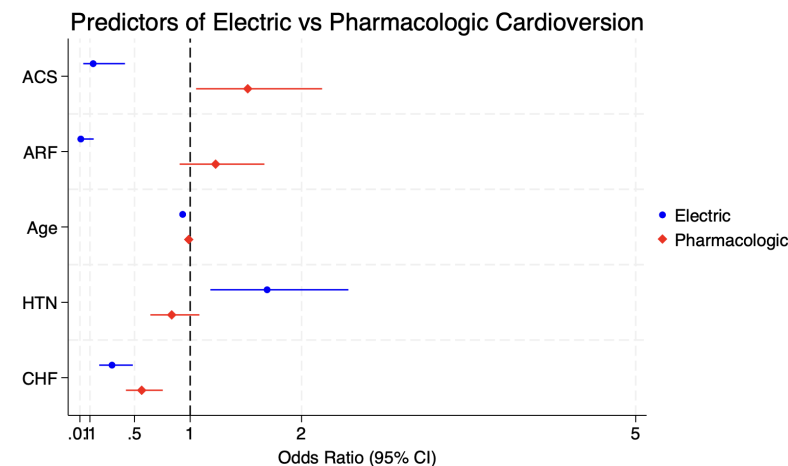


Figure 1. Forest plot of adjusted odds ratios for predictors of cardioversion strategy (95% CI; dashed line = OR 1).

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Cardioversion Strategy in Critically Ill Patients

	Pharmacologic Cardioversion	Electrical Cardioversion
ACS	Increased odds	Decreased odds
ARF	Not significant	Decreased odds
CHF	Decreased odds	Decreased odds
HTN	Not significant	Increased odds
Age	Decreased odds	Decreased odds

Discussion

- Guidelines support electrical cardioversion for instability, while stable patients may undergo either approach (1–3).
- ARF and ACS were associated with lower use of electrical cardioversion, consistent with literature favoring stabilization over procedural intervention in respiratory failure and active ischemia (2–4).
- Increasing age and CHF were also associated with reduced electrical cardioversion, reflecting higher procedural risk and recurrence (3–5).
- In contrast, hypertension was associated with increased electrical cardioversion, possibly representing a more stable patient subset.
- Cardioversion strategy in critically ill AF appears driven by acute physiologic status rather than comorbidities.
- Overall, these findings support a context-driven approach to cardioversion in critically ill patients, prioritizing physiologic stability and reversibility of illness (1–5).

References

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