

PERI-OPERATIVE PREDICTORS PREDISPOSING TO POST-OPERATIVE ATRIAL FIBRILLATION AFTER CORONARY ARTERY BYPASS SURGERY

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Introduction

Postoperative atrial fibrillation (POAF) is a common complication following cardiovascular surgery, with an incidence of 30% after CABG, 40% after valve surgery, and 50% after combined procedures. It typically peaks 2-3 days post-surgery and is associated with hemodynamic instability, thromboembolism, prolonged hospital stay, ICU readmission, organ failure, increased healthcare costs, and mortality.

The exact pathophysiology of POAF is complex, involving inflammation, oxidative stress, autonomic dysfunction, and electrophysiological remodeling, influenced by preoperative, intraoperative, and postoperative factors. Identifying high-risk patients is crucial for early prevention and management to improve outcomes and reduce complications.

Risk factors for POAF include advanced age, obesity, hypertension, diabetes mellitus, and COPD, though definitive predictors remain unclear.

The aim of the study was to identify perioperative risk factors contributing to POAF after CABG and assess its impact on patient outcomes.

Aim of the Work

The aim of this study was to detect peri-operative risk factors that predispose to development of post-operative atrial fibrillation after Coronary Artery Bypass Craft (CABG), and to asses the impact of atrial fibrillation on outcome.

Subjects and Methods

This retrospective observational study included 80 adult patients (≥ 18 years, both sexes) with preoperative normal sinus rhythm who underwent isolated elective CABG (on/off pump) at Alexandria University (Mar 2021 to Mar 2022).

Patients with combined lesions, BMI > 35 , preoperative arrhythmia, or use of anti-arrhythmic drugs other than beta-blockers were excluded.

Patients were classified into AF group (n=25) and no-AF group (n=55). The study endpoint was new-onset AF within the first postoperative week.

Preoperative assessment included history, examination, labs, ECG, angiography, and echocardiography. On-pump CABG used standard CPB with cold crystalloid cardioplegia; off-pump CABG used vessel stabilization and surgical blower-humidifier. Postoperatively, patients received continuous ECG monitoring in ICU and up to day 5 in the ward; beta-blockers were maintained. AF was defined as absent P wave with irregular rhythm, episodes > 5 min, and confirmed by 12-lead ECG when necessary.

Results

On pump arrested, preoperative beta-blocker use and EF and dose of postoperative inotropic support were significantly lower in AF group than non - AF group ($P < 0.05$). Right coronary lesion, ICU stay and hospital and mortality were significantly higher in AF group than non - AF group ($P < 0.05$). Management of atrial fibrillation was cardioversion in 9 (36%) patients and medications in 16 (64%) patients.

Table 1:

		AF group (n=25)	Non AF group (n=55)	P value
Type of isolated CABG	On pump beating	6 (60%)	4 (40%)	0.063
	On pump arrested	16 (24.24%)	50 (75.76%)	0.008*
	Off pump	3 (75%)	1 (25%)	0.088

Table 2:

		AF group (n=25)	Non AF group (n=55)	P value
Preoperative beta-blocker use		16 (64%)	47 (85.45%)	0.030*
Right coronary lesion		20 (80%)	22 (40%)	0.009*
EF (%)	Mean $\pm$ SD	43.52 $\pm$ 10.55	50.02 $\pm$ 14.08	0.043*
	Range	26 - 64	25 - 74	
Left atrium size (cm)	Mean $\pm$ SD	4 $\pm$ 0.34	3.96 $\pm$ 0.72	0.784
	Range	3.5 - 4.5	2.7 - 5.1	

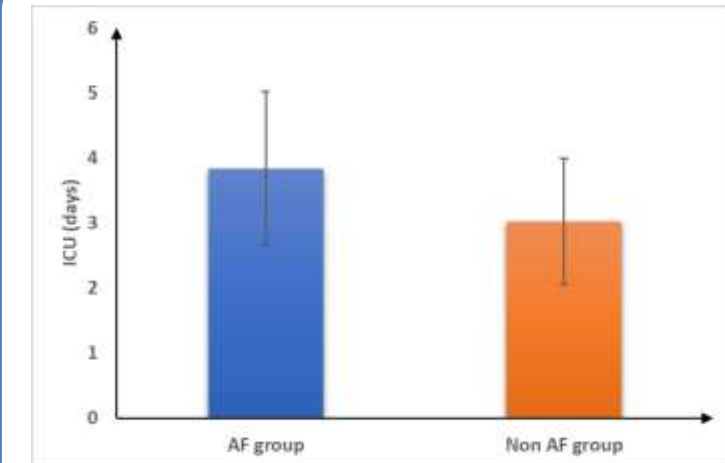


Figure 1:

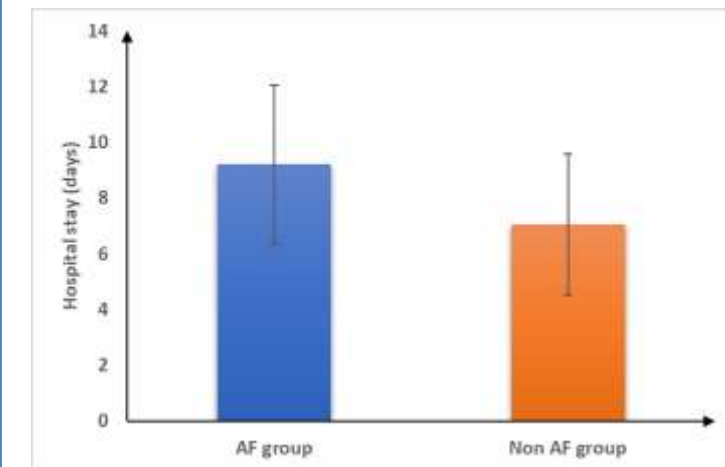


Figure 2:

Conclusion

Postoperative AF after CABG was linked to male predominance, lower EF, reduced beta-blocker use, more right coronary lesions, longer ICU/hospital stays, higher inotrope use, and increased mortality. The on-pump arrested technique may lower AF risk, highlighting the need for early risk factor optimization to improve outcomes.