

Original article

Study of effect of amiodarone in CABG

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Abstract:

Atrial fibrillation is the most common postoperative complication adding significantly to the morbidity rate and cost of coronary artery bypass surgery (CABG). AF is a supraventricular tachyarrhythmia diagnosed through irregular atrial activities and disappearance of atria mechanical function. In electrocardiogram (EGG), AF appears as quick vibrating waves replaced by P-waves and often accompanied by quick and irregular ventricular response. AF may occur in isolation or along with other arrhythmias. Incidence of atrial fibrillation after CABG is between 20% and 40%. . This arrhythmia is often benign and transient, but can cause hemodynamic disorders, thromboembolic complications, longer time of hospital stay and serious complications including cerebral apoplexy, and increase in the length of hospitalization. . Digoxin, calcium blockers, magnesium, glucose-insulin, potassium solution, and various cardioplegia are ineffective at preventing atrial fibrillation after CABG. Amiodarone is a multifaceted antiarrhythmic with a proven record of effectiveness in the treatment of atrial arrhythmias in a variety of clinical settings. Daud et al showed a significant reduction in postoperative atrial fibrillation with oral amiodarone in patients undergoing either CABG or valvular surgery . In this current

study we evaluated the effects of amiodarone in preventing intra and post op arrhythmias and compared it to subjects not receiving amiodarone preoperatively.

Keywords: Amiodarone , CABG

Introduction:

Atrial fibrillation is the most common postoperative complication adding significantly to the morbidity rate and cost of coronary artery bypass surgery (CABG). AF is a supraventricular tachyarrhythmia diagnosed through irregular atrial activities and disappearance of atria mechanical function. In electrocardiogram (ECG), AF appears as quick vibrating waves replaced by P-waves and often accompanied by quick and irregular ventricular response. AF may occur in isolation or along with other arrhythmias. Incidence of atrial fibrillation after CABG is between 20% and 40%.^{1,6} . This arrhythmia is often benign and transient, but can cause hemodynamic disorders, thromboembolic complications, longer time of hospital stay and serious complications including cerebral apoplexy, and increase in the length of hospitalization.² . Digoxin, calcium blockers, magnesium, glucose-insulin, potassium solution, and various cardioplegia are ineffective at preventing atrial fibrillation after CABG.³

Amiodarone is a multifaceted antiarrhythmic with a proven record of effectiveness in the treatment of atrial arrhythmias in a variety of clinical settings⁴. Daud et al showed a significant reduction in postoperative atrial fibrillation with oral amiodarone in patients undergoing either CABG or valvular surgery⁵

In this current study we evaluated the effects of amiodarone in preventing intra and post op arrhythmias and compared it to subjects not receiving amiodarone preoperatively.

Aim

To study the effect of perioperative oral amiodarone in CAD patients and comparing the outcomes in patients on amiodarone and not on amiodarone

Materials and methods:

- This is a retrospective observational study comprising of 200 patients operated in our department in years 2021 and 2022.
- All the patients had coronary artery triple vessel disease and were admitted atleast 1 week prior to planned procedure. In our department some consultants preferred prophylactic amiodarone for prevention of arrhythmias and other did not
- We identified 200 patients , 100 of these patients received preoperative tablet amiodarone 100 mg tds for 3 days and bd for 3 days and od dose thereafter till surgery
- Remaining 100 subjects did not receive any amiodarone preoperatively
- All patients received metoprolol 50 mg tds since the first day of evaluation in opd maintaining heart rate of around 60 -80/min ‘
- Inclusion criteria :
 - Patients between 30 to 70 years of age were included
 - Patients with triple vessel disease with and without left main disease were included
 - Patients with prior previous cardiac surgery /PTCA/ Pacemaker implantation/ conduction anomalies were excluded
 - Diabetic patients with Hba1c <8 were included

Patients with associated valvular heart disease were excluded

Patients with COPD / Pulmonary TB/ CVA were excluded

Patients with emergency surgery, ruptured papillary muscle, severe mitral regurgitation, postinfarction ventricular septal defect, NYHA class III or IV congestive heart failure, history of AF, hyperthyroidism, inflammatory diseases except coronary artery disease, infection, a left atrium (LA) size ≥ 70 mm, electrolyte imbalance, patients with <40 heart beats per minute were excluded

- All patients underwent preoperative routine investigations with ecg and Chest xray evaluation
- All cases were operated by offpump beating heart method and were converted to on pump if needed
- IABP insertion was done in patients with low cardiac output post CABG

Patients were shifted to step down ICU post surgery. They were shifted to ward when their hemodynamic and respiratory parameters become stable over next 3 days. Routine electrocardiography monitoring was continued during the operation and in the ward till discharge. All episodes of AF were recorded with 12-lead electrocardiographs.

Hospital mortality was defined as death for any reason occurring within 30 days after the operation.

Serum creatinine more than 1.5 was considered as renal impairment. Neurological complications defined as any episode of seizure or transient/permanent neurological deficit that developed after surgery.

Mortality, preoperative acute myocardial infarction, IABP usage, renal failure, use of inotropic agent, ICU and hospital stay, bleeding, revision rates, MACCE were determined

Patients were followed up at 6 months postop period and ECG was done

Results:

Our study comprises of 100 patients in group receiving cordarone and 100 patients in those not receiving cordarone

93 of the patients receiving cordarone were in sinus rhythm, 7 patients were in AF

91 patients not receiving cordarone were in sinus rhythm, 9 patients were in AF

Table 1: Patients with sinus rhythm and AF rhythm

		Rhythm			
		Sinus		AF	
		Count	Column N %	Count	Column N %
Group	Cordarone	93	50.5%	7	43.8%
	Non-Cordarone	91	49.5%	9	56.3%

10 patients (0.5%) among 200 had to be converted to on pump due to drop in pressure and fibrillation

3 patients (33%) were receiving cordarone and 7 patients (76%) not receiving cordarone

13 patients (0.65%) among 200 required IABP support

4 patients (30%) were receiving cordarone and 9 patients (69%) were not receiving cordarone

Table 2: Patients with IABP requirement, Patients with conversion to on-pump

		Conversion to On-Pump			
		Yes		No	
		Count	Column N %	Count	Column N %
Group	Cordarone	3	33.3%	97	51%
	Non-Cordarone	7	76.7%	93	48.9%

		Requirement of IABP			
		Yes		No	
		Count	Column N %	Count	Column N %
Group	Cordarone	4	30.7%	96	51.3%
	Non-Cordarone	9	69.3%	91	48.6%

143 patients among 200 had an episode of previous MI

Out of 143 patients who had MI 8 patients had to be converted to onpump

57 did not have a previous history of MI

6 patients required IABP and all of them had a history of MI

Table 3: Patients with a history of mi requiring iabp

		Requirement of IABP	
		Yes	No
		Count	Count
History of MI	Yes	6	137
	No	0	57

Table 4: Patients with a history of mi requiring conversion to on-pump

		Conversion to On Pump	
		Yes	No
		Count	Count
History of MI	Yes	8	135
	No	0	57

Our study shows there is no significance of cordarone use in conversion to on pump, duration of icu stay or postopinotropic and IABPrequirement

PATIENTS WITH “AF” IN CORDARONE AND NON CORDARONE GROUP:

A. Conversion to On-pump

		Conversion to On- Pump		Total	Chi-Square	p-value
		Yes	No			
Group	Cordarone	3	4	7	0.152	0.069
	Non-Cordarone	5	6	11		
Total		8	10	18		

B. requiring prolonged inotropic support

		Prolonged Inotropic support		Total	Chi-Square	p-value
		Yes	No			
Group	Cordarone	3	4	7	0.152	0.696
	Non-Cordarone	3	6	9		
Total		6	10	16		

C. prolonged i.e., >5 days ICU stay

		ICU Stay		Total	Chi-Square	p-value
		<=5 days	>5 days			
Group	Cordarone	3	4	7	0.254	0.614
	Non-Cordarone	5	4	9		
Total		8	8	16		

D. Requirement of IABP

		Requirement of IABP		Total	Chi-Square	p-value
		Yes	No			
Group	Cordarone	1	6	7	0.163	0.687
	Non-Cordarone	2	7	9		
Total		3	13	16		

PATIENTS WITH SINUS RHYTHM IN CORDARONE AND NON CORDARONE GROUP:

A. Conversion to On-pump

		Conversion to On- Pump		Total	Chi-Square	p-value
		Yes	No			
Group	Cordarone	0	93	93	0.000	0.988
	Non-Cordarone	1	90	91		
Total		2	182	184		

B. requiring prolonged inotropic support

		Prolonged Inotropic support		Total	Chi-Square	p-value
		Yes	No			
Group	Cordarone	4	89	93	0.001	0.975
	Non-Cordarone	4	87	91		
Total		8	176	184		

C. prolonged i.e., >5 days ICU stay

		ICU Stay		Total	Chi-Square	p-value
		<=5 days	>5 days			
Group	Cordarone	88	5	93	0.001	0.972
	Non-Cordarone	86	5	91		
Total		174	10	184		

D. Requirement of IABP

		Requirement of IABP		Total	Chi-Square	p-value
		Yes	No			
Group	Cordarone	2	91	93	0.317	0.573
	Non-Cordarone	4	90	94		
Total		6	181	187		

Table: Relation of Cordarone intake and ICU stay

Out of 200 patients 10 patients(5%) were in AF in immediate postop period and 190 (95%) were in sinus rhythm

Out of 10 patients 2 patients 19 % were receiving cordarone and 8 patients 81% were not receiving cordarone

At 6 months all patients receiving cordarone were in sinus rhythm whereas 4.5 % of patients were in AF

Rhythm in postop

group	AF	Sinus	total
cordarone	2	98	100
Non cordarone	8	92	100

Rhythm at 6 months postop

group	AF	Sinus	total
cordarone	0	100	100
Non cordarone	9	91	100

Conclusion

Amiodarone is a multifaceted antiarrhythmic with a proven record of effectiveness in the treatment of atrial arrhythmias in a variety of clinical settings⁴

In our study there was no significant effect of cordarone on conversion to on pump, duration of postop stay, IABP and inotropic support

More patients in non cordarone group were converted to on pump CABG than those in cordarone group but larger study groups are required to comment on its significance

Patients receiving cordarone had fewer rhythm disturbances intraop

In immediate postop period and at 6 months patients receiving cordarone were having sinus rhythm with fewer rhythm disturbances compared to non cordarone group patients

References:

1. Aranki SF, Shaw DP, Adams DH, Rizzo RJ, Couper GS, VanderVliet M, et al. Predictors of atrial fibrillation after coronary artery surgery. *Circulation* 1996;94:390-7.
2. Redle ID, Khurana S, Marzan R, McCullough PA, Stewart JR, Westreer DC, et al. Prophylactic oral amiodarone compared with placebo for prevention of atrial fibrillation after coronary artery bypass surgery. *Am Heart J*. 1999;138:144–150
3. Pehkonen EJ, Makynen PJ, Kataja MJ, Tarkka MR. Atrial fibrillation after blood and crystalloid cardioplegia in CABG patients. *Thorac Cardiovasc Surg* 1995;43:200-3
4. Escoubet B, Jaillon P, Berger Y, Commin P, Menasche P, Piwnica A, et al. Amiodarone and N-desethylamiodarone concentrations in plasma, red blood cells, and myocardium after a single oral dose: relation to hemodynamic effects in surgical patients. *Am Heart J* 1986;111:280-4
5. Daoud EG, Strickberger SA, Man KC, Goyal R, Deeb GM, Bolling SF, et al. Preoperative amiodarone as prophylaxis against atrial fibrillation after heart surgery. *N Engl J Med* 1997;337:1785-91.
6. Katzung BG. Basic and clinical pharmacology. 8th Ed. Mc Graw – Hill; 2001