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APPROACH TO PATIENTS WITH POSTOPERATIVE ATRIAL FIBRILLATION

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Atriyal fibrillasyon (AF) kardiyotorasik cerrahi sonrası en sık görülen aritmilerden olup hemodinamik bozulmaya, hastanede yatış süresinin uzamasına ve hastane giderlerinin artmasına yol açabilir ve serebrovasküler olaylara zemin hazırlar. Postoperatif AF'na (POAF) yaklaşım konusunda fikir birliği bulunmamaktadır. POAF'a yönelik yaklaşımlar perioperatif dönemde AF oluşmasını önleyici ve ventrikül hızını kontrol edici ilaçları ve spontan konversiyonun gerçekleşmemesi durumunda antikoagülan tedavinin eşlik ettiği veya etmediği farmakolojik ya da elektriki kardiyoversiyonu içerir. Biz bu yazıda POAF'a güncel yaklaşım metodlarını gözden geçirdik.

Anahtar kelimeler: Atriyal fibrillasyon, Cerrahi, Postoperatif

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GİRİŞ

Postoperative atrial fibrillation (POAF) occurs in 5% to 65% of patients undergoing cardiac surgical procedures, with the greatest risk on postoperative days 2 and 3[1-3]. Postoperative atrial fibrillation complicates 3% to 30% of noncardiac thoracic surgical procedures[4]. Unfortunately, the incidence of POAF remains high, occurring in up to 40% of patients, even when proven and recommended preventative drug therapy such as beta-blockers and amiodarone are employed[5]. Although, POAF is often regarded as temporary, benign, operation-related problem, numerous studies have demonstrated that when POAF develops, patients are at increased risk of developing hemodynamic instability, cerebrovascular complications, myocardial infarction and death. It is likely that these complications contribute to the increased hospital length of stay and treatment costs observed in patients with POAF[3-6].

The optimal management of POAF has not been determined. The current therapeutic strategies in the management of postoperative AF include prophylactic use of pharmacologic agents in the perioperative period to prevent the occurrence of AF and use of rate-controlling medications to control ventricular response, and if spontaneous conversion does not occur, use of pharmacologic or electrical cardioversion with or without concomitant anticoagulant therapy. In light of the importance of postoperative AF to patient outcome, there has been a great deal of interest in preventing this complication pharmacologically. However, the majority of patients undergoing cardiac surgery remain in sinus rhythm. Hence, routine pharmacologic prophylaxis could expose as many as 80% of the patients to the side effects of antiarrhythmic drugs for which there is no indication[3].

A few retrospective studies address the issue of ventricular rate control in the setting of POAF. In a small, retrospective, observational study, Myers and Alnemri[7] showed that a rate-control approach with digoxin, with or without verapamil, resulted in reversion to sinus rhythm in 90% of patients, with little risk of proarrhythmia. Tisdale et al[8] compared intravenous diltiazem with digoxin in patients with POAF. Rate control was achieved more rapidly with intravenous diltiazem, but lengths of hospital stay were similar with both drugs. The comparable rates of atrial fibrillation relapse suggest that antiarrhythmic therapy does not ensure that sinus rhythm will be maintained. In a study that assessed hospital readmission, atrial fibrillation was responsible for 21% of recurrent admissions[10]. The similar relapse rates, the comparable times to initial conversion to sinus rhythm, and the finding that the majority of patients were in sinus rhythm by 2 months support rate control as a viable option.

Cochrane database review[10] found 58 studies with a total of 8565 participants in which interventions

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included amiodarone, beta blockers, sotalol, and pacing. By meta-analysis, the effect size for prevention of stroke by prophylactic treatment for AF was not statistically significant, nor was the effect on length or cost of hospital stay[11]. Therefore, it is critical that before such pharmacologic measures are implemented in all patients undergoing cardiac surgery, clinicians ensure that these strategies have been conclusively found effective, safe, and to improve patient outcome.

Several strategies have been attempted to decrease the incidence of POAF, with mixed results. Different treatment modalities have been proposed to reduce atrial fibrillation after cardiac surgery; in randomized trials, pretreatment with B-blockers and amiodarone, was associated with risk reduction, whereas studies on other preventive drug therapies like calcium antagonists, class I antiarrhythmic agents, magnesium, digoxin, and glucose-insulin-potassium solutions have yielded inconclusive results[12]. In an analysis of 52 cardiac surgery trials evaluating pharmacologic strategies to prevent postoperative AF in nearly 10,000 patients undergoing open heart operations, it was shown that postoperative supraventricular tachyarrhythmias, including AF, occurred in 29% of patients who did not receive prophylactic drugs, compared with 12% in patients who received intravenous followed by oral amiodarone, 15% in those given sotalol, 16% in those given oral amiodarone, and 19% in those given beta blockers and that although no strategy has consistently been shown to be superior to another, the most effective approach to preventing POAF likely involves multiple interventions[13]. Under the American College of Cardiology/American Heart Association/European Society of Cardiology (ACC/AHA/ESC) 2006 guidelines, beta-blockers are recommended as class I agents in the prevention of POAF after cardiac surgery. Amiodarone and sotalol are considered as class IIa and IIb agents, respectively[11]. However, there are no published guidelines for noncardiac surgery.

Beta-blockers had the greatest magnitude of prophylactic effect across[10,14]. Beta-blocker use was found to reduce the incidence of POAF from 33% to 19%[15]. Also withdrawal of beta-blocker therapy during perioperative period is a well defined risk factor for POAF development[16]. In a meta-analysis of 24 trials[17] limited to patients with ejection fraction greater than 30% undergoing CABG, prophylactic administration of B-blocker medication protected against supraventricular tachycardia (OR 0.28, 95% CI 0.21 to 0.36)[11]. In an analysis[15] effect of postoperative B-blockers on hospital length of stay (LOS) was not significant (reduction of 0.66 day; 95% CI, -2.04 to 0.72). In the B-blocker Length of Stay (BLOS) study, when heart surgery patients were subdivided into chronic B-blocker users and those who were native to this medication before POAF prophylaxis, length of stay was prolonged for the subgroup of B-blocker naive patients who received this medication during their hospital stay (from 148.0±59.0 hours to 183.4±171.2 hours, P= 0.002)[18]. Additionally, this study did not demonstrate benefits in terms of hospital costs or stroke rate[18]. However, a large (N= 1660) prospective observational study with increased power to evaluate LOS as a primary end point found that prophylactic postoperative B-blocker use was associated with a shorter hospital LOS (mean, 2.2 days; P= 0.001) and a reduced incidence of POAF compared with no B-blocker use (-17.3%; P= 0.02)[19]. In another study[20] use of prophylactic B-blockade was associated with a 17.3% reduction in the incidence of POAF (P= 0.02) and a 2.2-day reduction in LOS (P= 0.001) compared with nonuse. It also was associated with a 25.7% (P < 0.001) reduction in total hospital costs compared with nonuse. Beta blockers are currently recommended for all patients undergoing open heart operation and these should be started preoperatively and should be continued after operation unless otherwise contraindicated.

Andrews et al.[17] analyzed 69 prospective randomized trials and found that digoxin and verapamil did not demonstrate any beneficial effects on POAF. However, a more recent meta-analysis of CCBs used for POAF prophylaxis found that nondihydropyridines significantly reduced the incidence of supraventricular tachycardias, including POAF, in cardiac surgery patients. In this study, calcium antagonists were also associated with a reduced incidence of myocardial infarction and ischemia[21]. Additionally, the administration of oral or intravenous diltiazem was associated with a decreased incidence of POAF after CABG[22]. Parker et al.[23] have shown in their studies that the use of preoperative and postoperative digitalis lowered the incidence of postoperative supraventricular arrhythmias following CABG. Selzer et al.[24] contradict the routine use of digitalis in the patients undergoing CABG because of the increased myocardial susceptibility and risk of toxicity. Kowey et al.[14] have observed that digoxin increases the atrial arrhythmias from 11 to 28%. In their study, it was also shown that digitalis when used alone was ineffective in postoperative arrhythmias[14]. Digoxin is ineffective when used prophylactic ally to prevent AF. When used for rate control, digoxin has been shown to be less effective than diltiazem during the first 6 hours, after which no differences exist[8,17]. It was shown that

the combination of the b-blockers and digitalis has a favorable effect on the prevention of postoperative AF[25,26].

Sotalol has been described to reduce the AF occurrence from 37% to 17%[15]. In a meta-analysis of 27 trials including 3840 patients, sotalol (80 or 120 mg twice daily) was more effective in reducing postoperative AF than either other B-blocker medication or placebo[27], but the results were not confirmed in another study[28], in which the difference between sotalol and B-blocker treatment was small. In a meta-analysis of ten studies sotalol and amiodarone were found to have similar efficacy in prevention of POAF[29]. In another study, amiodarone and a combination of metoprolol and amiodarone reported to be equivalent to sotalol when used as prophylaxis for POAF (frequency POAF: 30.2% combination vs. 31.7% sotalol vs. 53.8% placebo)[30].

Although sotalol is effective as a prophylactic strategy, there is a dose-related incidence of adverse effects. Suttorp et al.[31] compared high/low dose sotalol (240 vs. 120 mg daily) with high/low dose of propranolol. Patients who received high dose therapy of sotalol had a higher incidence of adverse drug events that necessitated cessation of therapy (10.5% vs. 2.8%, $p < 0.02$). This was despite a trend toward less postoperative AF in sotalol-treated patients. In another study[32], 22% of patients who received high dose sotalol therapy experienced bradycardia that necessitated dose reduction (12%) or discontinuation (10%).

The prophylactic use of amiodarone has shown to be effective in decreasing the incidence of POAF. Amiodarone prophylaxis was associated with reduction of as high as 52% in the frequency of POAF (OR, 0.48; 95% CI, 0.37 to 0.61), a 61% reduction of CVA (relative risk, 0.39; 95% CI, 0.21 to 0.76), (10,15,33-36) a reduction of 1.04 days in the length of stay (P= 0.001), and reduced total hospital costs (-$1398; 95% CI, -$2782 to -$14) (33,37). However, there's lack of a consensus regarding the homogenous dose, period of treatment and administration route.

When the prophylactic value of amiodarone, 600 mg per day, initiated at least 7 days preoperatively, was evaluated in 124 patients undergoing cardiac surgery, the incidence of AF was 25% in the treated group compared with 53% in patients randomized to placebo (P=0.003)[38]. Amiodarone halved the incidence of postoperative atrial tachyarrhythmias (AT), in the Prophylactic Oral Amiodarone for the Prevention of Arrhythmias that Begin Early after Revascularization, Valve Replacement, or Repair (PAPABEAR) trial[39], in which a 13-d perioperative course of oral amiodarone (10 mg/kg daily beginning 6 d before and continuing for 6 d after surgery) including; 16% (48/299) in the amiodarone group and 29.5% (89/302) in the placebo group (hazard ratio [HR], 0.52; 95% confidence interval [CI], 0.34- 0.69; P < .001). These approaches are impractical unless patients are identified and treatment started at least 1 week before surgery. Maras et al.[40] utilized a single oral dose of 1,200 mg one day before surgery and maintenance dose of 200 mg/day until the seventh postoperative day, showing a significant reduction in the incidence of atrial fibrillation only among elderly patients (26.7% vs. 43.1%). The amiodarone dose utilized by Katariya et al.[41] was 600 mg/day, started on the first postoperative day and kept until hospital release, showing a reduction in the incidence of atrial fibrillation of 19.7% in the control group to 4.7% in the amiodarone group.

In the Atrial Fibrillation Suppression Trial (AFIST)[42] 220 patients (mean age 73 yrs) undergoing open heart surgery were randomly assigned to two different treatment regimens with amiodarone: patients who enrolled less than 5 days before surgery were given amiodarone 400 mg 4 times/day on preoperative day 1, 600 mg twice/day on the day of surgery, and 400 mg twice/day on postoperative days 1-4 (rapid-load strategy). Patients who enrolled at least 5 days before surgery were given amiodarone 200 mg 3 times/day for 5 days before surgery, 400 mg twice/day on the day of surgery, and 400 mg twice/day on postoperative days 1-4 (slow-load strategy). At the analysis, the two types of treatment were grouped, showing a 41% decrease in the incidence of POAF (amiodarone 23% vs placebo 38%, P=0,01). Amiodarone was consistently more cost-effective than placebo because of similar hospital costs and greater effectiveness, regardless of subgroup characteristic: amiodarone loading strategy (rapid or slow), no preoperative ß-blockers, no history of atrial fibrillation, age older than 70 years, and no history of heart failure White et al[43] compared two strategies of the prophylactic use of oral amiodarone. The first group received oral amiodarone, which was started five days before the surgery, and kept until it totaled 7g; the other group received a rapid loading of amiodarone from the day before the surgery, at a dose of 1,600 mg, and was kept with 800 mg until it totaled 6 g, and the third group received placebo. Patients who received 7 g presented a significant risk reduction of 48.4% for the occurrence of atrial fibrillation, when compared to the placebo group, whereas the patients who received 6 g of amiodarone presented a risk reduction of 34% (p=0.054). Alcalde et

al.[44] showed a risk reduction of approximately 56% in the incidence of post-CABG atrial fibrillation or atrial flutter with prophylactic use of oral amiodarone, at a dose of 1,800 mg/day, with a mean total dose of 2,800 mg administered within a short-term period preoperatively (a maximum of 56 hrs before the surgery).

A recent study[45] suggested that postoperative administration of a high dose oral amiodarone after an intravenous bolus infusion is a safe, practical, feasible, and effective regimen for CABG patients. It significantly diminished the occurrence of POAF. This randomized, controlled, double-blinded trial included 250 eligible consecutively enrolled patients undergoing CABG. They received 300 mg of amiodarone/placebo administered intravenously over 20 minutes on the first postoperative day and an oral dose of 600 mg of amiodarone or placebo twice daily for the first 5 postoperative days. The patients in amiodarone prophylaxis experienced a reduction in risk of atrial fibrillation of 14% and the results for symptomatic atrial fibrillation showed a risk reduction of 18%. Of the patients who developed atrial fibrillation in the placebo group, 84% experienced a symptomatic attack versus only 43% in the amiodarone group.

The Amiodarone Reduction in Coronary Heart (ARCH) trial[46] is a large randomized postoperative study that administered intravenous amiodarone to patients undergoing either CABG, valvular, or combination surgery. Intravenous amiodarone, 1 g over 24 hours, was given for a period of 2 days following surgery. Patients randomized to amiodarone had a 26% reduction in the incidence of AF compared to placebo[46].

Postoperative Cardiovascular Arrhythmic Events (REDUCE) Trial[47] randomized patients undergoing cardiac surgery to receive either sotalol 80 mg 2 times per day (n= 76) or intravenous amiodarone 15 mg/kg over 24 hours followed by oral amiodarone 200 mg 3 times per day (n= 83) for 7 days or until discharge. Amiodarone and sotalol shared similar efficacy and safety in reducing postoperative AF (17% vs 25% p= 0.25). However, in a subgroup analysis, the incidence of AF in patients undergoing AVR or CABG with AVR was significantly less with amiodarone (1/15, 7%) compared to sotalol (9/11, 82%) (P < .001).

In a meta-analysis[48] based on a literature review of 14 randomized controlled trials, amiodarone doses of 3000-5000 mg appear to be more effective than lower doses in reducing postoperative atrial fibrillation. Doses higher than 5000 mg did not offer additional benefit. In terms of timing for optimal prevention of atrial fibrillation, initiating amiodarone postoperatively appears to be as effective as a preoperative start of this medication. According to this meta-analysis, amiodarone reduced the incidence of atrial fibrillation by 51% compared with placebo (P < .001) in post-cardiac surgery patients, with an ideal dose of 3000-5000 mg. amiodarone is effective regardless of whether it is administered before or after surgery. This is important because postoperative administration can be more convenient than preoperative administration. On the other hand, a meta-analysis[49] including 18 trials and 3408 patients (1736 received amiodarone and 1672 received placebo) showed that amiodarone was associated with an increased risk of developing bradycardia (odds ratio [OR], 1.70; 95% confidence interval [CI], 1.05-2.74) and hypotension (OR, 1.62; 95% CI, 1.04-2.54). The greatest risk in the occurrence of these adverse events arose when using regimens containing intravenous amiodarone, initiating prophylaxis during the postoperative period, and using regimens with average daily doses exceeding 1 g. Oral amiodarone regimens were less likely to cause bradycardia and hypotension than were intravenous regimens. Amiodarone did not appear to affect other safety endpoints.

Recent observational data have suggested a possible protective role of angiotensin-converting enzyme inhibitors (ACEI's), potassium supplementation, and nonsteroidal anti-inflammatory drugs on POAF, but no randomized data are available on these agents[5,49-51].

In two meta-analyses not involving cardiac surgery patients, it was determined that chronic therapy with an ACEI or angiotensin receptor blocker (ARB) could reduce patients' odds of developing new-onset AF by about 50%[51,52]. In a recent study, however, the preoperative use of an ACEI or ARB was not found to be associated with a statistically significant reduction in POAF although preoperative ACEI or ARB use was found to reduce the odds of developing POAF by 29% (p= 0.20)[50]. It is important to note that this 29% reduction in POAF with ACEIs and ARBs was seen in a population that already had a high background utilization of both beta-blockers (84%) and prophylactic amiodarone (38%), both of which are highly efficacious drugs in preventing POAF following cardiac surgery. Whether, an ACEI or ARB when administered alone would exert a larger or statistically significant effect is not known.

The use of statins has recently been related to a 3-fold decrease in the odds of atrial fibrillation after noncardiac thoracic surgery independent of CRP levels. In contrast to AF in the general population, early markers of inflammation did not predict the postoperative occurrence of AF[53]. Treatment with atorvastatin 40 mg/d regardless of cholesterol levels, initiated 7 days before surgery, significantly resulted in a 61% risk reduction in the incidence of postoperative atrial fibrillation (35% vs. placebo 57%, P=0.003) after elective cardiac surgery with cardiopulmonary bypass and shortened hospital stay in ARMYDA-3 study[54]. In that study, the treatment effect occurred irrespective of age, sex, presence of diabetes mellitus, or chronic obstructive pulmonary disease, but atorvastatin had no benefit in patients with left atrial enlargement or those undergoing valve surgery. Postoperative peak CRP levels were higher in patients who developed atrial fibrillation in either arm, and on multivariable analysis, CRP levels above the median were associated with increased risk. This appears to confirm that higher inflammatory status is an important factor in the development of postoperative atrial fibrillation. One report suggested that n-3 polyunsaturated fatty acids may be effective for prevention of AF in patients undergoing CABG surgery[55].

Prasongsukarn et al[56] s reported results of 86 patients undergoing CABG surgery: Forty-three patients received 1 g of methylprednisolone before surgery and 4 mg of dexamethasone every 6 hours for 1 day after surgery, and 43 patients received only placebo postoperative AF incidence was 21% in patients who received steroids vs 51% in a placebo group, but the steroid groups also had more minor complications. In a recent study[57], 241 patients without prior AF undergoing CABG surgery, valve replacement, or both were randomized to 100 mg of hydrocortisone or matching placebo on the operative day followed by 1 dose every 8 hours for the next 3 days. The administration of intravenous hydrocortisone reduced the relative risk for postoperative AF by 37% compared with placebo.

Several studies have been conducted to examine the efficacy of prophylactic MgSO4 for the prevention of POAF after open heart surgery. Most of these studies have reported favorable results but others have failed to confirm these findings[58,59,60]. Since the B-blockers prevent the loss of intracellular Mg, it can be postulated that prophylactic MgSO4 may be more effective in patients who are not offered preoperative beta blockers. However, B-blockers are currently recommended for all patients undergoing open heart operation and these should be started preoperative and should be continued after operation unless otherwise contraindicated. Postoperative use of MgSO4 combined with amiodarone has proved to be capable of reducing the incidence of POAF in normomagnesemic patients[61]. The combined administration of sotalol and magnesium has been demonstrated to markedly decrease the occurrence of postoperative AF to 1.9% after CABG[62]. However, in another report[63], this combined regimen failed to reduce the incidence of postoperative AF. Nonetheless, such prophylactic drug strategy clinically implies important side effects; hypotension and bradycardia being the most frequent encountered side effects.

According to a recent study[64] combination of ascorbic acid with B-blockers is superior to B-blocker prophylaxis alone, well-tolerated and relatively safe. Patients in the ascorbic acid group received 2 g of ascorbic acid on the night before the surgery and 1 g twice daily for 5 days after surgery. The incidence of postoperative atrial fibrillation was 4% in the ascorbic acid group and 26% in the control group (P= 0.002). Studies conducted thus far have used a variety of pacing sites, stimulation rates, and concurrent pharmacological therapies, and have yielded mixed results[65]. There is limited evidence that single-chamber and biatrial overdrive pacing prevents POAF. A meta-analysis[55] comparing various types of atrial pacing to routine care after CABG surgery found that AF was reduced by RA pacing (OR 0.68, 95% CI 0.39 to 1.19), LA pacing (OR 0.57, 95% CI 0.28 to 1.16), and biatrial overdrive pacing (OR 0.46, 95% CI 0.30. There is also evidence that both single-site and biatrial pacing reduce the risk of POAF after cardiac surgery when administered concurrently with B-blockers. Available data suggest that biatrial pacing may be superior to either LA or RA pacing for prevention of POAF[65-67].

A study[69] showed little difference between between an antiarrhythmic conversion strategy (n= 27) and a rate-control strategy (n= 23) in time to conversion to sinus rhythm (11.2±3.2 vs 11.8±3.9 hours; P= .8). Both arms received anticoagulation with heparin overlapped with warfarin and regardless of strategy. After the initial conversion to sinus rhythm, a high incidence of recurrent atrial fibrillation was observed in both groups. Although the rates of relapse were higher in the rate-control arm, this was not statistically significant (30% vs 57%, P= 0.24). There were no significant difference in relapse rates at 1 week (24% vs 28%), 4 weeks (6% vs 12%), and 6 to 8 weeks (4% vs 9%). At the end of the study, 91% of the patients in the rate-control arm were in sinus rhythm compared with 96% in the antiarrhyth-

mic arm (P = .6). Length of hospital stay and surgical discharge were reduced with the conversion strategy compared with the rate-control strategy (9.0±0.7 vs 13.2±2.0 days; P = .05). This difference was small but persisted with multivariate analysis, independent of the effects of age, sex, B-blocker usage, and type of surgery. This differs from the findings of Solomon et al[70], who showed retrospectively that a rate-control strategy reduced length of stay and decreased hospital cost. The American College of Cardiology/American Heart Association/European Society of Cardiology (ACC/AHA/ESC) 2006 AF guideline recommends the administration of atrioventricular nodal blocking agents to achieve rate control in patients who develop POAF as class I indication[11].

According to a study comparing esmolol vs. diltiazem in prevention of AF after open heart surgery diltiazem provided better rate control whereas esmolol was more effective in converting patients to sinus rhythm[71]. These differences were evident only during the initial 6 hours for cardioversion and 12 hours for rate control. Similar results were observed in another study comparing esmolol with diltiazem in patients without heart disease who had postoperative supraventricular arrhythmias[72].

A variety of pharmacological agents, including amiodarone[73], sotalol[74] and ibutilide[75] may be effective to convert AF to sinus rhythm. Oral sotalol is appealing in this situation because its B-blocking action slows the ventricular rate and proarrhythmic toxicity is relatively infrequent, but this agent seems less effective than others for cardioversion of AF[11].

Direct cardioversion may be attempted during emergency situations with hemodynamic instability and during hypothermic period. In the highly symptomatic patients or when rate control is difficult to achieve, cardioversion may be performed using the same precautions regarding anticoagulation as in nonsurgical cases[11]. Internal cardioversion using heart wires demonstrated effectiveness and safety in treating POAF. The energy level required for a successful cardioversion was low and well-tolerated by the patients under slight sedation without any analgesia. Easy and fast placement, uncomplicated removal of the wires, as well as quick and easy shock application are advantages of the system. With low energy required, internal cardioversion is able to reduce the duration of AF episodes following open heart surgery below 24 hours, if adequate concomitant antiarrhythmic medication is given. It can be expected that the effectiveness of the system will improve patient outcome and reduce hospital costs in the future[76].

Overdrive pacing may be an alternative treatment modality for postoperative atrial tachyarrhytmias. Successful termination of atrial flutter after heart surgery by means of overdrive atrial pacing through epicardial leads had been reported[77,78].

A number of studies have shown an increased risk of stroke in post-CABG patients[79,80]. Accordingly, anticoagulation with heparin or oral anticoagulation is appropriate when AF persists longer than 48 h. This entails special challenges because of the greater potential for bleeding in surgical patients. The choice of drug, heparin and/or an oral anticoagulant, must be based on the individual clinical situation[11].

The incidence of the atrial arrhythmias after cardiothoracic surgery remains high (10% to 40%) despite efforts at pharmacologic prophylaxis. Over 90% of atrial arrhythmias revert to sinus rhythm spontaneously within two months[1-7]. The optimal treatment strategy for postoperative arrhythmias, especially AF after coronary bypass surgery, is not well established. Commonly used therapeutic approaches include the use of rate-controlling drugs such as digoxin, ß-blockers, calcium antagonists, and pharmacologic or electrical cardioversion. A few retrospective studies have suggested that a strategy utilizing rate-control agents may be reasonable and perhaps cost-saving[2,7]. Due to self-limited course of postoperative AF and possibility of spontaneous reversions during antiarrythmic therapy, increasing the risk of thrombo-embolism, rate control associated with anticoagulation seems reasonable in stable patients. Cardioversion may be reserved for patients who can not tolerate AF hemodynamically or severely symptomatic patients.

Comorbidity including adrenergic stress often makes it difficult to control the ventricular rate in patients with postoperative AF. ß-blockers are the first choice agents due to increased sympathetic activity. Short-acting ß-blocker agents are particularly useful when hemodynamic instability is a concern. Other AV nodal blocking agents, such as the nondihydropyridine calcium channel antagonist agents, can be used as alternatives, but digoxin is less effective when adrenergic tone is high. Intravenous amiodarone has been associated with improved hemodynamics in this setting[11,68]. Rate control may not be achieved with a single agent. Anticoagulation with heparin or oral anticoagulation is appropriate when AF persists longer than 48 h.

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